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ABSTRACT

To investigate and analyze the role played by the industrial sections of the educational, intervening, and employment training systems in meeting manpower needs and to determine output and costs of these systems, interviews were held with employment officials, educators, and recruitment and training officers to obtain information concerning their activities. In addition, structured interviews were held with 243 workers to determine training history. Findings revealed that the intervening system acts as a link between the graduates and dropouts of the educational and employment systems. There is a trend toward transferring the training activities of the intervening system to the employment system. Utilization of school curriculum in performing current jobs revealed substantial duplication of learning, and the general theory component was more useful in acquiring new skills, while specific skills were least utilized in employment. These findings suggest that the educational system of Tunisia should put less emphasis on specific training and more emphasis on producing readily trainable, rather than specifically trained, persons. To reduce educational expenses, the problem of dropouts and repeaters must be studied, and the educational system should be relieved of specific training functions in order to eliminate duplicate training. A related document is available as VT 011 965. (SB)

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by Najati Mohammed Amin Al-Bukhari

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FOREWORD

by Eugene Staley

In a previous monograph of this series Dr. Al-Bukhari communicated the results of a study of the industrial secondary schools in his home country, Jordan, comparing the costs of producing their graduates and the effectiveness of these graduates on the job with those of the general secondary schools. He also investigated, by interview and observation, the extent to which specific skills, specific theory, general skills, and general theory from the curriculum of the industrial schools are in fact employed in the jobs held by graduates.

In the present monograph Dr. Al-Bukhari reports on a parallel investigation raising similar questions which he carried through in another Arab country, Tunisia. In the case of Tunisia, however, there is a greater complexity and variety of education-training pathways by which future workers in industrial and service activities can acquire their skills. Notably, besides the education-training programs of the school system and of the employment system (including public and private employing establishments) there is an important government agency, the Office of Training and Employment, which Dr. Al-Bukhari labels "the intervening training system." His analysis of these three systems -- their structure and methods of working, indications of their costs and effectiveness, their interrelations, and the duplication of effort that sometimes occurs -- should prove enlightening to the many decision-makers and researchers throughout the world who are concerned with the knotty problems of occupational education and training in the context of great developmental needs and severe constraints imposed by scarce resources.

This is the fourth in a group of studies on occupational education and training as related to development produced in the SIDEC research program on "Content and Methods of Education for Development." As explained by Professor Paul R. Hanna, Director of SIDEC, in a foreword introducing the first publication in the series, the aim of the research program is to throw light on a set of problems central to education's role in modernization and development. What educational content is most relevant to and most likely to assist in desired types of economic-social-political development -- especially in, but not limited to, the newly developing nations? The focus of the program, in other words, is on the curriculum problem viewed from the standpoint of requirements of development in a nation or other communities of men. Three sectors of this broad problem are currently being emphasized:

Occupational Education and Training, Education's role in the Formation of Social and Civic Attitudes, and Education's role in the Rural-Urban Transformation. A list of the studies already issued or about to be issued appears on page ii

This three-pronged series of studies, including the present one on the role of industrial secondary schools in Tunisia, is made possible by a research contract between the Office of Education, Department of Health, Education, and Welfare, United States Government, and Stanford University.

TABLE OF CONTENTS

Page

FOREWORD by Eugene Staley v

INTRODUCTION 1

Issues as Related to Tunisia 2
Purpose of the Present Study 3

PART ONE

The Three Training Systems

Chapter 1 FACTORS LEADING TO THE EMERGENCE OF THE THREE SYSTEMS 5

Chapter 2 THE EDUCATIONAL SYSTEM AND OCCUPATIONAL EDUCATION AND TRAINING 7

The Elementary School 7
The Second Cycle of Education 11

Chapter 3 THE INTERVENING TRAINING SYSTEM AND OCCUPATIONAL EDUCATION AND TRAINING 19

Training in Centers 21
Training of Already-Employed Workers 27

Chapter 4 THE EMPLOYMENT SYSTEM AND OCCUPATIONAL EDUCATION AND TRAINING 30

The Case of the Railways 30
The Case of the Cement Factory 37
The Case of the Gas and Electricity Company 39
The Case of the Civil Aviation and Meteorology Department and the Merchant Navy 44
The Occupational Training Tax 49

PART TWO

Utilization of Training, Appropriateness of Curricular Contents and Benefit/Cost Analysis

Introduction 51

Chapter 5 THE GRADUATES IN THE EMPLOYMENT SYSTEM 53

TABLE OF CONTENTS--Continued

Page

Chapter 5 (Continued)

Related Research Studies 53
Interview Methodology of the Present Research 55
Curriculum Components and the Methodology of Rating Their Utilization 61
Workers with Three Years of Post-Elementary Industrial Education: Category (M) 63
Workers with More than Five Years of Secondary Education: Category (S) 68
Workers of the Upgrading Training Centers: Category (P) 72
Workers of the Accelerated Centers: Category (F) . . 81
Workers with Elementary Education: Categories (A), (PA), and (I) 83
Summary of Findings of the Interviews with Workers . . 84

Chapter 6 BENEFIT/COST ANALYSIS 87

The Public Educational System 87
The Intervening Training System 94
The Employment System 95
Cost of Training in the College Moyen and the Intervening System Combined 96
Cost of Training in the College Moyen and the Employment System Combined 97
Cost of Training in the Secondary School and the Employment System Combined 98
Cost Per Successful Graduate 100
Comparison of Costs 101
Comparison of Costs Between Tunisia and Jordan 101
Benefits 105
Benefit/Cost Analysis 105
Findings on a 10% Discount Rate 109

PART THREE

Summary and Policy Implications

Chapter 7 SUMMARY AND POLICY IMPLICATIONS 111

BIBLIOGRAPHY. 119

APPENDIX 123

INTRODUCTION

Experts of different disciplinary and professional backgrounds have attempted to tackle the problem of providing occupational education and training for the middle-level manpower required to meet the present and projected development needs of industry in developing countries. Among those who have contributed to the discussion of this problem are professional educators, economists, and administrators. Some have described or evaluated existing practices [Harbison & Myers:1965, Williams:1963, Corazzini:1966]; others have proposed modifications to what is now practiced or have suggested new lines of action [Harbison & Myers:1964, Foster:1965]; still others have offered an integrated model for the organization of occupational education and training or evaluated the theoretical foundations of existing practices [Staley:1967, Harbison:1967].

The question of manpower training is as complex as it is important, and particularly so for developing countries, which lack resources. Those concerned with the problem must first identify or assign the functions of the educational and employment systems by considering not only the manpower requirements, present and future, and the hiring and training practices of the employing establishments, but also the educational and employment needs of the students. How are these related? To what extent can aspects of occupational education and training be assigned to one or the other system or to what extent are they a function of both? A policy that coordinates the roles and functions of the two systems must be established. Such a policy would aim for the more effective preparation of young workers, the avoidance of duplication of efforts, and the most efficient division of functions.

The attempt to identify functions immediately raises the question of whether, in the field of occupational education and training, the educational system should be concerned mainly with supplying a broad general education and some preoccupational education and training, or whether it should also be concerned with providing specific occupational training [Harbison & Myers:1964:56, Staley:1967:3]. The existing practice in several countries is to have two types of secondary schools, one general or academic, where the course of study is designed to prepare for higher education, and the other vocational, which is expected to be terminal. The vocational secondary school provides its clientele with specific skills needed for various trades. Other countries have only one type of secondary school, the comprehensive or multipurpose secondary school, in which both general and preoccupational education are offered. In such countries the provision of specific skills is largely left to the employment system or to special training institutions [Conant:

1959:38, Keller:1955:18]. The assignment of specific skill training to the employment system is based on the idea of relating occupational training more specifically to ongoing economic activities [see Foster: 1965:The Vocational School Fallacy]. There are some cases in which the employment system also provides opportunities for further education in both technical and general education [Ennaceur:1967:5]. The content of the general education curriculum has been much discussed recently [Harbison & Myers:1964:96, Staley:1967:2-6]. Current literature emphasizes the importance of language, mathematics, and the natural and social sciences in general education at the secondary level. There are many claims that products of such programs are more trainable, versatile, adaptable, and flexible than products of specific vocational programs.

The issues that need to be confronted are these: where to provide specific education and training; whether the school should be concerned only with general education and some preoccupational education or should be concerned also with specific training; whether the employment system should undertake specific training and also perhaps offer provisions for further education; and what should be the role of special training organizations and institutions intermediate between schools and employment. The settlement of such issues will lead to a balanced division of functions and a coordination of efforts between the employment system and the educational system.

ISSUES AS RELATED TO TUNISIA

Tunisia has three systems which provide occupational education and training for the formation of middle-level skilled manpower. The three systems are those managed respectively by the Ministry of Education, to be referred to as the educational system, the Office of Training and Employment, to be referred to as the intervening training system, and the employing establishments (public and private), to be referred to as the employment system. Each of these three systems provides specific skill training. The educational system operates industrial sections in the secondary schools and the college moyen. The intervening training system has pre-apprenticeship, accelerated, and upgrading training centers. The employment system has training centers in some of the public sector employing establishments and provides apprenticeship and intern training in many of the public and private employing establishments. This situation, in which specific training is provided in three parallel systems, provides a good case for investigation of the issues raised above.

PURPOSE OF THE PRESENT STUDY

The present study has two major purposes. The first is to investigate and analyze the role played by the industrial sections of the educational system, the training centers of the intervening training system, and the training activities of the employment system in meeting middle-level manpower needs of employing establishments in Tunisia. Part One of the study discusses the three systems with respect to their training activities, their students and trainees, and their curricula. The second major purpose is to learn more about the output and costs of the three systems. Part Two of the study presents empirical data concerning the educational and training backgrounds of samples of employed workers. The intention is to discover whether there was a repetition in the learning of specific skills provided by more than one of the three systems and to analyze the degree of utilization of the curriculum of the educational system in job performance or in the acquisition of new skills. Part Two then presents an analysis of the costs of education and training in each of the three systems and a benefit/cost analysis of more than one existing alternative in occupational education and training. Part Three presents a summary of the present research and the implications for policy.

PART ONE

THE THREE TRAINING SYSTEMS

CHAPTER 1

FACTORS LEADING TO THE EMERGENCE OF THE THREE EXISTING SYSTEMS

Independence

When Tunisia was ruled by France, few Tunisians occupied positions in the economy that required modern skills. High-level and middle-level skill positions were occupied either by French nationals or by other foreigners. Tunisians were employed mainly in jobs that required traditional or low-level skills or no skills. In brief, the Tunisians composed the semi-skilled and unskilled part of the labor force, while the foreigners composed the skilled part. This situation was the result of colonial policy, which denied technical education to Moslem Tunisians [Tuqan:1962:4].

Immediately after independence, the exodus of foreigners began [Debeauvais et al.:1961:9]. About 255,325 Europeans left the country in 1956 [Ministry of Planning:1965:16]. It is estimated that by the end of 1968 only 22,000 foreigners will remain [Ministry of Planning:1965:18]. Leaders of Tunisia, among them those concerned with occupational education and training, found that the country was in a technical crisis and in sudden need of middle- and high-level skilled manpower [Debeauvais et al.:1961:9]. Intensive national efforts were, therefore, geared to meet these sudden needs [Tuqan:1962:4]. The Four-Year Plan of 1965/68 states that Tunisia has not yet completely recovered from the adverse effects of colonial policy that denied occupational training to the Tunisians [Ministry of Planning:1965:25].

Demography

The occupational education and training program in Tunisia should also be understood within the context of certain demographic facts. Tunisia is a country in which 50% of the population are below the age of 20 and where the age group of 5-14 accounts for 1,148,000 persons out of a population of 4,341,000 (see Table 1-1). Tunisia is, thus, a country of the young.

Table 1-1

Population Distribution

Age Group	%
0-4	16.5
5-14	24.3
15-19	9.2
20-59	43.2
60-above	6.8

Source: Four-Year Plan:Ministry of Planning, Tunisia:1965.

The government's efforts in education were concentrated in the initial post-independence period at the elementary level [Ministry of Education:1963:31]. The educational reform of 1958 resulted in the continuing effort to provide elementary education to as many children as possible [Ministry of Education:1963:38].

Drop-Outs

Many young Tunisians drop out of the elementary school. Many finish the sixth grade but are unable to continue their education. Drop-outs also occur frequently at the secondary level. All of these young people join the labor force unprepared to engage in productive employment. Officials claim that their unemployment is due to their lack of the skills required to perform available jobs rather than to a lack of jobs [Ministry of Planning:1965:25].* In order to cope with the phenomenon of school leavers, the intervening training system and the employment system came to play a decisive role in the field of occupational education and training in Tunisia.

Thus, occupational education and training in Tunisia must be viewed within the context of the exodus of foreign skilled manpower, the population explosion, and the elementary school leavers and drop-outs from the secondary schools.

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*For another view of this question, see Chapter 3, p. 9.

CHAPTER 2

THE EDUCATIONAL SYSTEM

AND

OCCUPATIONAL EDUCATION AND TRAINING

The educational system in Tunisia begins with six years of elementary education, after which some students are bifurcated either to the three year terminal college moyen schools or to the six year nonterminal secondary schools. Both of these types of post-elementary schools offer occupational education and training in their industrial sections. The elementary school does not provide any occupational offerings as such. Nevertheless, the elementary school should be analyzed because some of its graduates who are not admitted to the second cycle of education go through the intervening training system (discussed in Chapter 3) or get training in the employment system as apprentices.

THE ELEMENTARY SCHOOL

School Age Children Attending School

As has been previously stated, education in Tunisia from the time of independence in 1956 until now has been characterized by the effort to provide elementary education for as many school age children as possible [Tuqan:1962:8]. At present, 73.65% of the elementary school age children are attending schools (see Table 2-1). The number of children attending elementary schools has increased from 320,362 in 1958 to 794,035 in 1967 (Table 2-2).

Table 2-1

Number of School Age Children Attending Schools in 1967-68

Category	Number	%
Children at schools	794,035	73.65
Children out of school	283,465	26.35
Total of school age children	1,077,500	100.00

Source: Ministry of Education Statistical Records

Table 2-2

Number of Children Attending Elementary Schools since 1958/59

Year	Number
1958/59	320,362
1959/60	361,532
1960/61	408,758
1961/62	465,577
1962/63	527,373
1963/64	593,059
1964/65	658,766
1965/66	717,093
1966/67	777,686
1967/68	794,035

Source: Ministry of Education Statistical Records.

Two factors account for the number of children out of school. First, some school age children live in inaccessible places [Ministry of Planning:1965:39]. Second, society places a relatively low value on education for girls. Ninety-two per cent of all school age boys are attending schools but only 30% of the girls [Ministry of Planning;1965: 39].

Elementary School Graduates and Leavers

All students who successfully finish the sixth elementary grade sit for the qualifying examination for admission to the second cycle of education, the secondary schools or the college moyen schools. It has been the policy of the Ministry of Education to accept into the second cycle only 40% of those who reach the sixth elementary grade. The 60% of the students who do not qualify in the entrance examination either terminate their education or repeat the sixth grade [Ministry of Education: 1966:28].

Elementary school leavers who are not admitted to the schools of the second cycle of the educational system may choose from the following alternatives:

1. Join the employment system as apprentices supervised by the intervening training system.
2. Join the pre-apprenticeship centers of the intervening system for one year. After this they join the employment system as apprentices.
3. Join some of the training centers of the employment system that offer a curriculum similar to the college moyen, but in which the specific skills learned are related to the needs of the training employing establishments.

Problems in Elementary Education

Some aspects of the system of elementary education should be noted here. Although they are important questions, they do not fall within the scope of this research and for this reason are not discussed in detail. Reference is made to them because of their cost implications. President Bourguiba was the first to point to inherent weaknesses in elementary education [Bourguiba:1967:19]. The educational commission of the ruling Socialist Destouri Party recently issued a report on elementary education in response to the criticisms made by the President concerning education in general and elementary education in particular [Socialist Destouri Party:Elementary Education Report:1967:8]. One of the points under discussion concerned the number of instruction hours per week. A child in the elementary school gets fifteen weekly hours of instruction in the first and second grades, twenty-five weekly hours in the last four elementary grades. The validity of giving instruction in such a small number of weekly hours was questioned. In its Report the commission recommends the addition of five hours per week to all six elementary grades [Socialist Destouri Party:Elementary Education Report: 1967:10).

Since education is not compulsory in Tunisia, the elementary schools have drop-outs in addition to repeaters. The Four Year Plan contemplates the following percentages of repeaters and drop-outs in the elementary schools. School planners take these ratios into account in their projections, although there are some variations from the given ratios of the Plan.

Table 2-3

Planned Percentages of Students Promoted, Repeating or Dropping-out in Each of the Six Grades of the Elementary School

Category	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Promoted	70	75	68	64	51	40
Repeaters	26	23	28	30	39	44
Drop-outs	4	2	4	6	10	16
Total	100	100	100	100	100	100

Source: Ministry of Planning:Four Year Plan:1965.

According to percentages given in the Plan, approximately 30% of the 794,035 elementary school students in the year 1967/68 are repeaters of the previous year. Tuqan estimates the average annual rate of repeaters in the elementary schools at 25%; he adds that this high percentage cannot be found in any other country of the Middle East [Tuqan:1962:27].

Because of budget implications, it is worth mentioning that Tunisia spends 51.7% (or 12,715,570 TDs) of its educational budget on elementary education (see Table 2-4). Jong maintains that the value of the annual financial waste resulting from repeaters and drop-outs at the elementary level is equivalent to one-fourth of the budget of the Ministry of Education or 6% of the total national budget [Jong:1966:23].

Table 2-4

Current Budget of the Ministry of Education
for the Year 1966/67

Category	No. (TDs)	%
Central administration	435,190	2.5
Higher education	1,652,030	6.0
Secondary education	6,189,750	25.1
Moyen education	2,625,460	10.7
Elementary education	12,715,570	51.7
Social service	982,000	4.0
Total	24,600,000	100.0

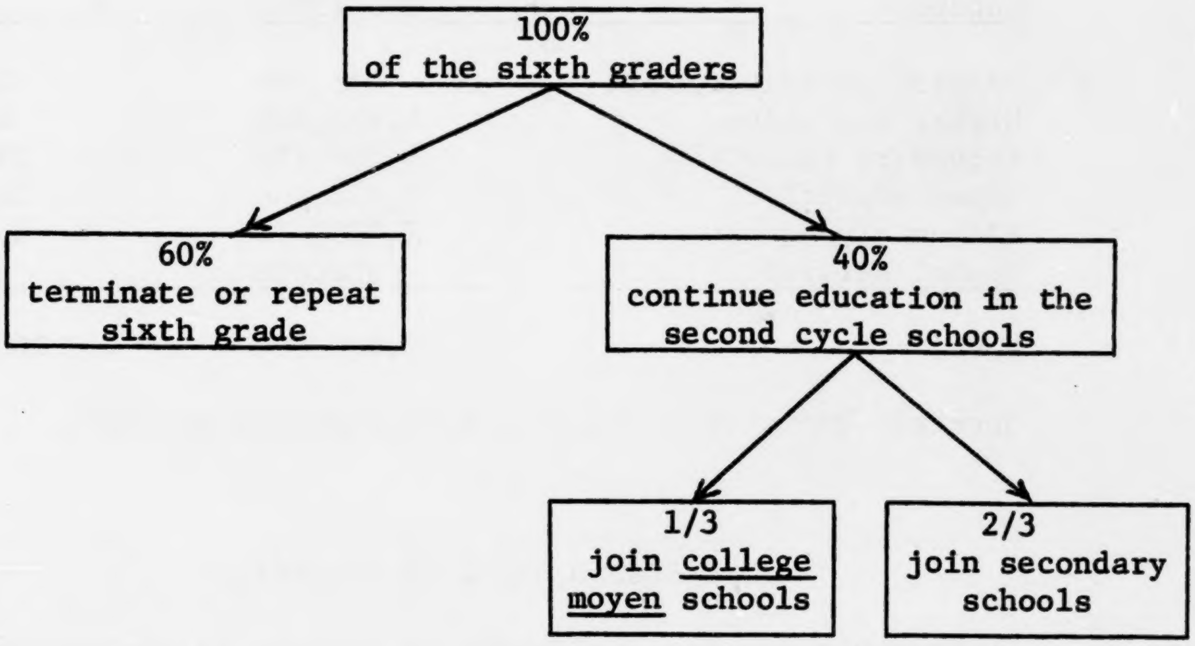
Source: Ministry of Education Statistical Records.

THE SECOND CYCLE OF EDUCATION

Tunisia has two parallel types of schools in the second cycle of education. One of them is the three year college moyen school, which is terminal; the other is the six year secondary school, which leads to higher education in Tunisia or abroad. Of the total number of students who finish the sixth grade of the elementary school, 40% are accepted in the first year of either the college moyen or the secondary school [Ministry of Planning:1965:53]. It has been the established policy of the Ministry of Education to accept 1/3 of the 40% of the students who finish the elementary school in the college moyen, and 2/3 of the 40% in the secondary school [Ministry of Planning:1965:53]. Diagram 2-1 illustrates this process.

Diagram 2-1

Selection of Students to the Second Cycle


100%
of the sixth graders
60%
terminate or repeat sixth grade
40%
continue education in the second cycle schools
1/3
join college moyen schools
2/3
join secondary schools

The College Moyen

The *college moyen* is an institution that educates students who passed the entrance examination to the second cycle but, because they were above age or did not have the required average, could not be admitted to the secondary schools. Most of the students of the *college moyen* schools are between the ages of 14 and 17 [Ministry of Education:1966:6]. Being above the required age for admission to the secondary school is caused more often by frequent repetition of several years in the elementary school than by delayed entrance into the first grade. This observation was confirmed in interviews with workers who had attended the *college moyen* (see Chapter 5).

After the three years of the *moyen* education, students sit for a public qualifying examination called the *Brevet de l'Enseignement Moyen*. According to statistical records of the Ministry of Education, about 50% of those who reach the third *moyen* year pass the public qualifying examination. For example, of the 6631 students who were in the ninth grade in 1966/67 only 2682 got the *BEM* (see Table 2-5). The remaining 50% either repeat the year in order to take the examination again or take testimonials from the school certifying that they finished their *moyen* education.

Table 2-5

Student Enrollment in the College Moyen
Since 1965

Category	Grade 7	Grade 8	Grade 9	BEM
1964/65	8,773	6,109	4,355	
1965/66	10,008	7,481	5,548	
1966/67	12,130	8,832	6,631	2,682

Source: Ministry of Education Statistical Records.

First year students in the college moyen are divided among three sections: the general, the commercial, and the industrial. According to the Four-Year Plan, 60% of the students are streamed into the industrial section; the remaining 40% are equally divided between the general and the commercial sections [Ministry of Planning:1965:54]. There are plans to alter this ratio by reducing the general section to 17% and increasing the commercial to 23% (see Table 2-6).

Table 2-6

Existing and Planned Ratios of Students
in the Three Sections of the College
Moyen

Category	Existing ratio	Planned ratio
General section	20	17
Commercial	20	23
Industrial	60	60
Total	100	100

Source: Ministry of Planning, Four-Year Plan, 1965.

For analytical purposes later in this study, the curriculum of the industrial sections will be divided into two main parts, the theoretical and the practical. The theoretical in turn will be divided into two components. The first is the general theory component, which includes Arabic, French, history, civics, mathematics, science, and labor laws. The second, the specific theory component, includes technology and industrial drawing. The practical part of the industrial curriculum is comprised of the specific skills and the general skills components. General skills refer to the initial skill orientation that the student gets, in addition to the transferable skills of the trade. The specific skills are those related to the trade in which the student specializes.

This method of considering the curriculum as composed of four components -- the specific skills component, the specific theory component, the general skills component, and the general theory component -- is employed in Part Two for rating the degree of utilization of the school curriculum in the workers' current jobs.

Every college moyen school, being composed of three sections -- the general, the commercial, and the industrial -- contains a workshop. Students of the industrial sections share with the students of the general and commercial sections all the educational facilities in addition to the workshops. Furthermore, every college moyen school includes a boarding section that accommodates about 50% of the total number of students.

Occupational Future of the Students

According to data obtained in the survey of workers (Chapter 5), the occupational future of the college moyen students may take one of the following patterns: Drop-outs and school leavers may join the employment system directly or join the accelerated training centers of the intervening system and then join the employment system. (First, second, and third year drop-out students of the industrial sections all get the same kind of training in the accelerated centers.) Those who get the Brevet de l'Enseignement Moyen may join the employment system directly or join the upgarding centers of the intervening training system and then go into employment.

Whether the students join the centers of the intervening training system and then join the employment system, or join the employment system directly, it is possible that they will get new training in the employment system in skills for which they were not previously trained (see Chapter 5).

The Secondary Schools

Secondary education in Tunisia is a privilege given to 2/3 of the 40% selected for further education from among the total number of students who finish elementary education. These students are below 14 years of age and have achieved a high rank in the entrance examination to the second cycle of education [Ministry of Education:1966:20]. Secondary education is of six years' duration. In its efforts to reform secondary education, the Educational Commission of the ruling Socialist Destouri Party recently recommended the addition of one year to both the secondary and moyen schools, thereby making the duration of secondary education seven years and moyen education four years [Socialist Destouri Party:Secondary Education Report:1967:3].

All students entering secondary school study a common program in the first year (seventh grade). In addition to Arabic, French, geography, history, civics, mathematics, and sciences, students are taught elements of industrial design and spend three hours a week in workshops.

At the beginning of the second year, students are streamed into three sections: the general, the economic, and the technical. The general section receives 60% of the students, and the economic and technical sections each receive 20% [Ministry of Education:1966:20]. The achievement of the student in the first year and a system of guidance determine the section into which he goes, and this broadly determines his occupational future.

These sections are, in fact, three types of education that are provided in relatively independent tracks. A secondary school may contain all three sections, just two sections, or only the technical section, in which case the school is called a Lycee Technique. A student can be a member of only one section, and he takes the set of courses that is normally given in that section for two years, the second and third secondary years.

Starting with the fourth year (tenth grade), the following streaming of students takes place: (1) Students of the general section are branched into four options; the liberal arts, the sciences, mathematics, and teacher training; (2) The economic section is branched into the commercial and the economic options; (3) The technical section is branched into the technical mathematics and the industrial options. This arrangement continues from the fourth to the sixth secondary years, that is from the tenth to the twelfth grades (see Diagram 2-2).

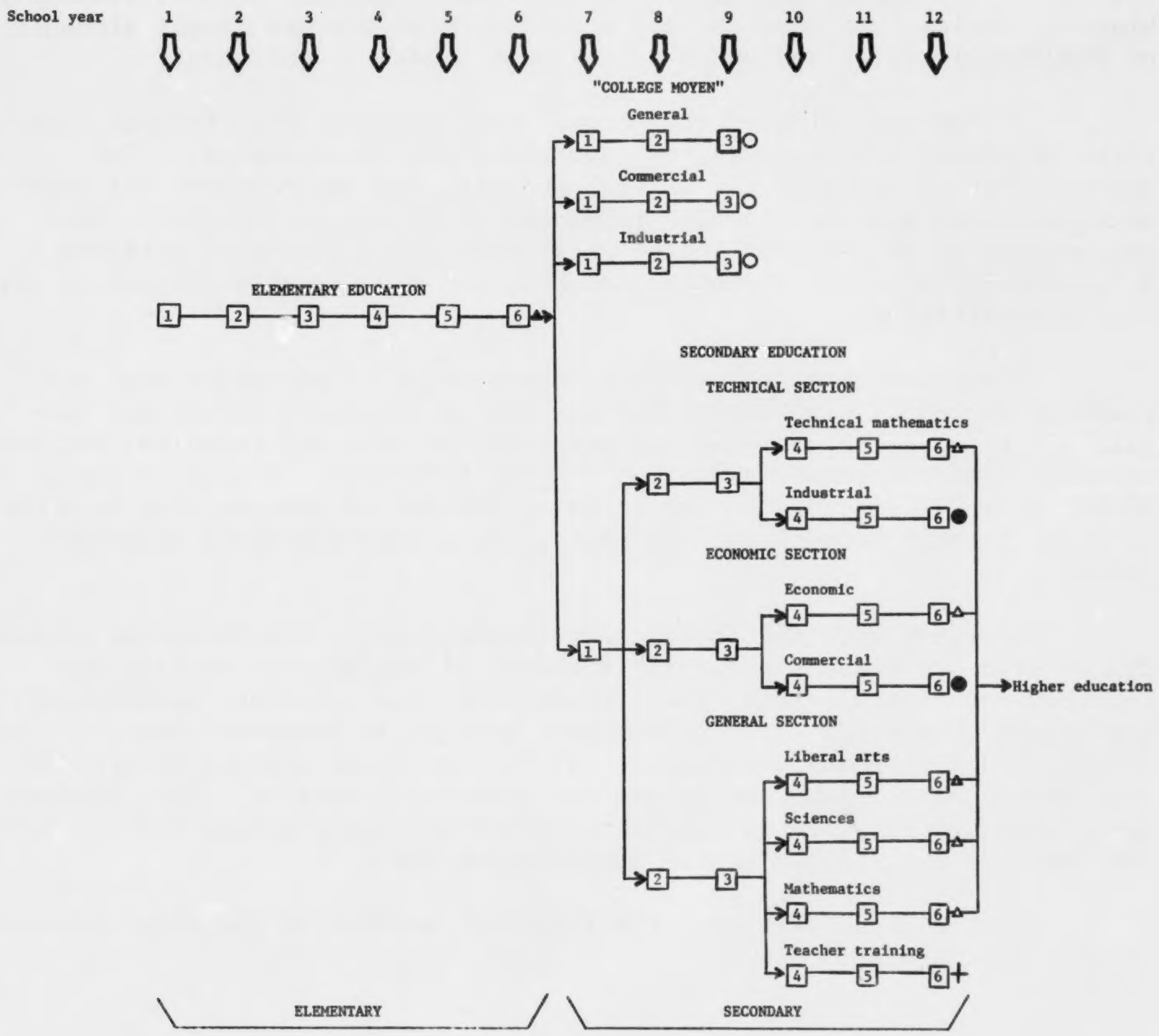
Of the three sections, the technical section is the most relevant to this research project.

The Two Options of the Technical Section

All students of the technical section study a common curriculum in the second and third secondary years (eighth and ninth grades). In addition to the literary, mathematical, and scientific courses of general education, the curriculum contains a considerable number of hours for industrial design and workshop training (see Table 2-7).

Diagram 2-2

TUNISIA: THE EDUCATIONAL LADDER 1965/66



Key:

- ○ Moyen Education Diploma (BEM), Terminal
- ▲ Qualifying Examination to the Second Educational Cycle
- △ Secondary Education Diploma: To higher education
- ● Commercial or Industrial Secondary Education Diploma: To higher technical institutes
- + Teacher Training Diploma

Table 2-7

Weekly Program of the Eighth and Ninth
Grades of the Technical Section

Category	Hours per Week	
	Eighth grade	Ninth grade
Arabic	6	6
French	5	4
A second foreign language	3	3
History and geography	2	2
Civics	1	1
Mathematics	4.5	4.5
Physics	2	2
Sciences	1	1
Athletics	2	2
Industrial design	4	5
Workshop	7	8
Technology		1
Total	37.5	39.5

Source: Ministry of Education, Technical Report, 1966.

One-fourth of the students finishing the third year of the technical section are branched into the technical mathematics option, while the remaining three-fourths are branched into the industrial option with its eight fields of specialization. Students of the technical mathematics option take a curriculum that emphasizes mathematics, physics, industrial design and technology. Seven hours per week are devoted to workshop training in the fourth year, six hours in the fifth year, and four hours in the sixth year.

The eight fields of specialization offered in the industrial option include mechanics, electrical work, chemistry, laboratory aids, dress making, and two fields in the building industry. Workshops and laboratories are available for these specializations. All students take a common curriculum of general education in addition to one of the specialized curricula.

Occupational Future of the Students

Data obtained by the interviews with workers (Chapter 5) suggest the following patterns for the occupational futures of the secondary school students. The students who drop out of the secondary schools either join the employment system directly or join the centers of the intervening training system and then the employment system. In either case there is the possibility that the students will be trained a second or third time in the employment system.

Graduates of the secondary school who receive diplomas (2,000 students for 1966/67, or 2% of the original first elementary grade class) have the right to pursue higher education in Tunisia or abroad.

CHAPTER 3

THE INTERVENING TRAINING SYSTEM
AND
OCCUPATIONAL EDUCATION AND TRAINING

The Tunisian government has established a system of occupational training whose stated purpose is to function as a bridge between the educational system and the employment system. The system provides training for the drop-outs and school leavers of the educational system and helps them get appropriate employment. An additional function is supervision of the training activities of the employment system.

The agency in charge of this intervening training system is the Office of Training and Employment [Ennacuer:1967:4]. Although most of the training activities of the system are currently undertaken in specially designed training centers, the Director General of the Office, Mr. Mohammed Ennacuer, stated emphatically in an interview that the basic philosophy of the Office is the gradual transfer of the training functions undertaken by the Office to the employing establishments.

The Office of Training and Employment came into existence as a result of forces stemming from both the educational system and the employment system. Tunisia has been experiencing a comparatively high rate of drop-outs in the elementary and secondary cycles. Of those who started elementary education in 1958/59, only 55% reached the sixth grade in 1963/64. More significant is the fact that only 2% of those who enrolled in the first grade in 1955/56 finished the twelfth grade with diplomas in 1966/67. This high rate of attrition can be explained by the selective philosophy of education followed by the Ministry of Education and by the efforts of the Ministry to meet quantitative targets prescribed by the national plan.

If only 2% of the students finish the twelfth grade, the remaining 98% of the students leave school at some time during the twelve grades and presumably, in most cases, join the labor market. The Ministry of Social Affairs established the Office of Training and Employment and specially designed centers to help the drop-outs by providing training prior to employment. Of course, the intervening training system cannot solve the problems of all drop-outs and school leavers. However, the existence of such a system, with its training activities for the drop-outs of the general sections of the college moyen and secondary schools as well as the elementary school leavers, gives some indication of the possibilities of training outside the educational system.

Some of the drop-outs, particularly those of the elementary schools, join the employment system as apprentices. The employing establishments were utilizing the traditional apprenticeship system to train new recruits in their trades. One of the main achievements of independent Tunisia in the field of labor legislation was the establishment of state supervision over the traditional system of apprenticeship [Code Du Travail:1966:105]. The impact of this legislation resulted in recognition of a need for preoccupational training and education for the elementary school leavers before they become apprentices and led to reforms in the traditional apprenticeship system itself. The Office of Training and Employment became the agency for organizing and supervising apprenticeship.

Outline of the Training Activities of the Intervening System

The Office of Training and Employment operates three types of occupational training centers, which offer one year programs:

1. The preoccupational, preapprenticeship training centers. These centers are especially designed to give preoccupational training to elementary school leavers who will then become apprentices in the employment system [Ennacuer:1967:5].

2. The occupational accelerated training centers. These centers are especially designed for the drop-outs of the general and industrial sections of the college moyen and secondary schools. The intervening system also attempts to find proper employment for these trainees [Ennacuer:1967:3].

3. The upgrading occupational training centers. These centers are especially designed to upgrade the skills of the graduates of the college moyen schools who have the Brevet de l'Enseignement Moyen Diplomas of the industrial section. Trainees are either fresh graduates or already employed. The latter are usually sponsored by their employing establishments. The number of already employed trainees in the upgrading centers has been decreasing recently. This is because some of the sponsoring establishments now have their own upgrading training centers.

The Office of Training and Employment also has diverse activities for already-trained people. The training activities in this category are coordinated with and supplement the employment system. One function which will not be the focus of further discussion is the training of instructors for the training centers and foremen of the employing establishments, carried out by the National Training Center operated by the Office at Rades [United Nations Activities in Tunisia:6]. Three other programs will be discussed:

1. Modernizing the apprenticeship practices of the employment system. Elementary school leavers who are apprentices in the employment system are provided with the technical theoretical background for their trades [Ennacuer:1967:5].

2. The Institute of Technical General Education. The Intervening system has initiated a system of evening courses for already employed workers who have an incomplete secondary education. Such workers can join these evening general and mathematical courses which enable them to complete their secondary education. In other words, the program aims at raising the average level of educational attainment of middle-level skilled manpower.

3. The program of sponsored trainees in the employment system. This refers to the system of internship by which graduates of the college moyen with the BEM are employed by an establishment but paid by the Office of Training and Employment.

TRAINING IN CENTERS

Preoccupational, Preapprenticeship Training Centers

The preapprenticeship center is a "Tunisian specific formula to prepare young people aged 14 to 17 for efficient on-the-job training" [Fontaine:1967:1]. Twenty centers were established in 1963 in the various districts of Tunisia. There are now sixty-five such centers with a total enrollment of 3070 trainees (Table 3-1).

Table 3-1

Number of Preapprenticeship Centers with Enrollments, by Years since 1963

Category	Number of Centers	Number of Graduates
1963	20	800
1964	44	1760
1965	52	2324
1966	61	2520
1967	65	3070
Total number of graduates		10,474

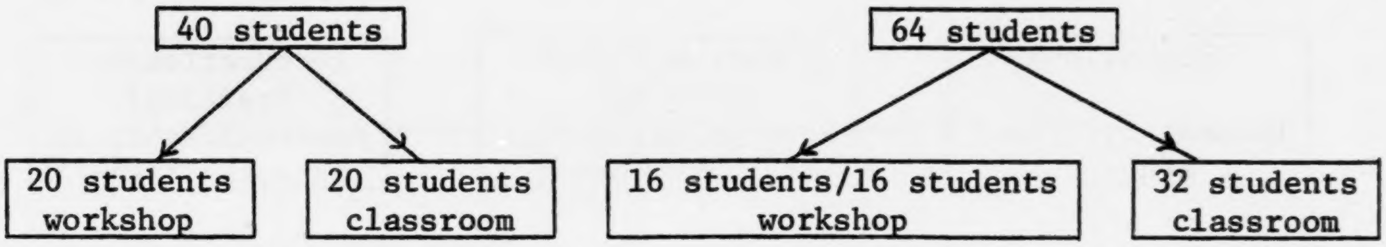
Source: Records of the National Training Institute, Rades.

The main aim of these centers is to provide the trainees with some pre-employment orientation in basic skills and general work habits. The centers are for boys, although centers for girls are planned [Ministry of Social Affairs:1967:9]. Ten of the present centers accommodate 64 students each; the others have 40 students each. As a general rule centers are built where industrial establishments offer apprenticeships. In 1967 some centers were closed because no factories or workshops were available for the placement of students [interview with head of the PA centers].

Every center building has three components: the workshop, the classroom, and the restaurant. Each center for 40 students has two instructors, one for the general education part of the curriculum and the other for workshop instruction. The centers with 64 students have three instructors, two for the workshop and one for general education. The diagram below shows how students are divided into classrooms and workshops.

Diagram 3-1

Division of Students of the Pre-apprenticeship Centers



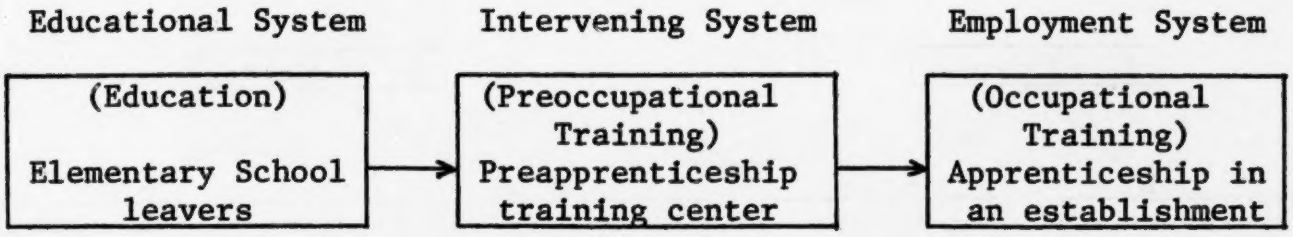
Instruction is for eleven months beginning in September and ending in July of every year. The curriculum is divided equally between general education and the workshop. In general education students study Arabic, French, arithmetic, geography, and health education. In the workshop, students are given practical orientation in six major vocational fields: electrical work, mechanics, welding, fitting, autobody, and smithery. The purpose of the workshop is to provide the students with manual dexterity and knowledge about these broad vocational fields so that they may choose one of them when the time comes for apprenticeship in industry. There is one principal for approximately every four centers [Interview: Head of Pre-apprenticeship Centers].

There is a placement office in every district of the country for the selection of employing establishments in which graduates of the centers will be apprentices. A contract is signed by the employer and by the apprentice and his guardian [Code Du Travail:1966:107]. According to the contract, the apprentice gets nominal pay and will have to serve a probation period of two months. The apprenticeship period varies from 18 months to five years, at the end of which the apprentice gets a diploma. According to the Apprenticeship Law, each establishment should accept a minimum of 20% to a maximum of 40% of its total number of skilled manpower as apprentices. Supervisors appointed by the Office of Training and Employment visit the apprentices in the establishments to advise, inspect, and help with problems.

The product of this arrangement is a skilled young worker who got his education in the educational system, his preoccupational training in the intervening system, and his occupational training in the employment system. Diagram 3-2 shows the relationship between the three systems.

Diagram 3-2

Relationship between the
Three Systems


Educational System
Intervening System
Employment System
(Education)
Elementary School leavers
(Preoccupational Training)
Preapprenticeship training center
(Occupational Training)
Apprenticeship in an establishment

The future of the preapprenticeship centers depends upon the capacity of the employment system to absorb the increasing number of elementary school leavers and drop-outs trained by the preapprenticeship centers. High officials are of the opinion that there are many establishments that could hire a larger number of apprentices [Al-Sabah:December 19, 1967]. Nevertheless, a one-month intensive campaign was started in the city of Tunis on December 19, 1967 to get placements in the employing establishments for the graduates of the preapprenticeship centers. The necessity for such a campaign is an indication, as several of the Office supervisors noted, that the industrial and services sectors of the economy will shortly be saturated with the drop-outs and leavers of the educational system.

The present exodus of Tunisian skilled and semi-skilled workers seeking work abroad, mainly in Europe and Libya, might be another indication of the limited capacity of the Tunisian industrial sector to absorb the large number of young people who did not complete their high school education. (There is also the possibility that young Tunisians are attracted by higher wages and better occupational futures in European countries or Libya.) About 4080 workers left the country in the seven months ending in December 1967 [Al-Amal:December 6, 1967]. The number of workers who left Tunisia between 1962 and 1966 is 10,474. The Minister of Social Affairs stated that by the end of 1968 there will be 100,000 Tunisians in the working age with no work. The Minister added that these will be surplus and beyond the needs of the Tunisian economy [Al-Amal: December 6, 1967].

Occupational Accelerated Training Centers

The admission requirements for the accelerated centers specify that the applicant be between the ages of 18 and 35 and have three years of education either in the general section or the industrial section of the college moyen or three years in the secondary school.

To check how far the official admission policy is put into practice, the researcher collected data concerning the educational background of students currently being trained in the accelerated centers. The actual educational background indicates more variation than is shown in the official admission policy. Table 3-2 shows the range.

Table 3-2

Educational Background of Trainees of the Accelerated Training Centers

Category	Number of Trainees	% of Trainees
3 years of college moyen industrial section	48	35.0
3 years of college moyen general section	20	14.0
1-2 years of college moyen industrial section	7	4.5
1-2 years of college moyen general section	40	30.0
Others, including full elementary education	23	16.5
Total	138	100.0

Source: Centers Records and field interviews.

In other words, from the point of view of background in industrial training, trainees joining the centers may be categorized into four groups: those with three years of industrial training background, those with two years of industrial training background, those with one year of industrial training background, and those with no industrial training background. In this last category are trainees who may have one to three years of general secondary education or have only six years of elementary education.

It is important to note that all four groups of students, with their differing educational backgrounds, get the same kind of occupational training in the accelerated centers. One possible conclusion should be stated. The educational background really utilized in the center is the general education. Any curriculum component beyond that brought from the educational system is duplicated and thus to some extent wasted.

Occupational Upgrading Training Centers

The upgrading training centers improve the skills brought by persons to the center. The admission requirements for the upgrading centers specify that the applicant should be between the age of 18 and 35 years and have the Brevet de l'Enseignement Moyen of the industrial section or its equivalent. The clientele of the upgrading training centers were found (from interviews and records of the centers) to be of homogeneous educational background, having the Brevet de l'Enseignement Moyen of the industrial section. In this case also there is the possibility of duplication. The training of the educational and intervening systems might not be used in the employing establishments, or the upgrading training itself may be a repetition of the training undergone in the educational system. An observation concerning the admission requirements to the accelerated and upgrading centers is worth noting. Students of both centers have completed three years in the industrial section; the difference between the two groups is that only the holders of the BEM degree attend the upgrading center. Field interviews revealed that there is in fact no difference between the two groups in the type of jobs performed and earnings and only slight differences in the actual training given them in the two centers.

In 1966/67 there were nine centers for accelerated and upgrading training. Some of the centers are for accelerated training only, such as the one in Rades; others are mixed, such as Ariana center; and others are only for upgrading, such as the electricity center in Tunis.

Table 3-3

Graduates of the Training Centers

Category	Year of Establishment	Number of Graduates
Cipe	1959	361
Chaussure	1958	541
Ariana	1960	248
Rades	1963	261
Sousse	1963	196
Sfax	1964	171
Gabes	1965	139
Medinene	1966	93
Menzel Bourguiba	1964	277
Total		2287

Source: National Institute of Training, Rades, Records.

A one-year accelerated or upgrading center usually has a curriculum that consists of 30 weekly hours of workshop training, 5 hours of technology and mathematics, 2 hours of industrial design, one hour of labor legislation, and one hour of physical education [Center Records].

There has been a trend in the intervening training system toward establishing a three-year post-elementary occupational program similar in many respects to the industrial sections of the _college moyen_. The researcher visited the Menzel Bourguiba training complex, which contains (1) an upgrading program center, (2) a preapprenticeship program center, and (3) the three-year occupational program. The last was established with the help of the West German Republic and is now under the technical supervision and instruction of German specialists. The researcher is of the opinion that this is a highly expensive venture whose aim could be achieved by a modified arrangement of the accelerated program. It is expensive because (1) the students are recruited from the preapprenticeship centers, which means six years of elementary education and a year of preoccupational training, and the low student-teacher and student-workshop ratios of the new program result in a high per-pupil cost ratio for the three years when compared with the similar _college moyen_ program. In addition, there is always the possibility that a graduate of any training program outside the employment system might get duplicative training in the employment system. Therefore, the argument made earlier is repeated here: first, we should see what the employment system can offer in training for specific skills, and then outside agencies can provide a foundation for and complement what the employing establishments do.

TRAINING OF ALREADY-EMPLOYED WORKERS

Apprenticeship in the Employing Establishments

There are two kinds of apprentices with elementary education. The first, which was discussed earlier, is the elementary school leaver, who gets one year preoccupational training in the preapprenticeship center before joining the employment system as an apprentice. The second is the elementary school leaver who joins an employing establishment without going through the preapprenticeship center. In both cases, the Office of Training and Employment is the agent that helps the school leavers find apprenticeships. Through this arrangement the Office is attempting to control all apprenticeship practices for the purpose of helping apprentices and employers.

Before, and for a few years after, independence, most apprentices were either illiterates or had only a few years of elementary education. Most apprentices now have elementary education and are under the continuous supervision of the intervening system. The rise in the level of educational attainment brought a new element to the system of apprenticeship in Tunisia. In the past it was not possible to supplement the training of apprentices with theoretical foundations in their trades because of their low educational attainment. The new elementary school apprentices, however, can be given further education, both technical and general, while employed. To accomplish this, the intervening system has organized courses in industrial design, mathematics, and technology for already-employed apprentices. The program is presently organized on a pilot basis. A supervisor of a group of related trades is appointed as an instructor. The courses are given three times a week in the morning in Tunis, while in Bizerte they are given in a one-full-day arrangement, on Saturdays.

Thus, the rise in the level of educational attainment led to the reform of the traditional apprenticeship system in Tunisia. The Office of Training and Employment has supervised the employment and apprenticeship of 9470 apprentices from 1962 to 1966 [Office documents].

The Institute of Technical General Education

As part of the educational activities of the intervening training system, the Institute of Technical General Education was established. There are at least two such institutes, one in Tunis and another in Bizerte.

The main aim of the Institute is to provide already employed workers who have some secondary education with the opportunity to pursue their technical theoretical education until they reach the equivalent of the sixth secondary grade, an opportunity that was denied to them in the educational system [Institute documents]. The positive aspects of this program are:

1. It teaches science and mathematics courses that are valuable for any modern occupational career.
2. The costs are negligible.
3. It gives participants the security and prestige of a complete secondary education.

The researcher was much interested in discovering the problems facing the Institute, through the interviews with employed workers. Very few of the workers who are eligible are actually studying in the Institute. Unfortunately, there is a lack of publicity about the program. Many of the workers never heard of the Institute. A second problem is that employed workers find it hard to be evening students. Many of the interviewed workers who had begun the program were unable to continue.

Sponsored Trainees in the Employment System-Internship

An often repeated allegation of industrial establishments is that graduates of industrial sections of the *college moyen* lack practical experience; hence, employers hesitate to recruit them [interview with Mr. Mohammed Ennacuer]. As a solution to this problem, some of the degree-holding graduates of the *college moyen* are placed by the intervening training system in certain establishments as sponsored trainees for six months [Ministry of Social Affairs:*Conseil National*:1966:13]. During the period of in-employment training, the salary is paid by the Office of Training and Employment. According to official statistics, 484 such trainees were placed between 1962 and 1966. Many of these interns continued to be employed in the original establishments, while others sought employment in other establishments.

Concluding Remarks

The Office of Training and Employment, as compared with the Ministry of Education, offers a flexible program that adapts itself to the changing needs of the employment system and problems emerging from the increasing number of drop-outs of the educational system. This analysis of the activities of the Office, therefore, represents the situation at the time the research was conducted. The effectiveness of its training activities and the possibility of duplication of efforts are analyzed in Chapter 5.

CHAPTER 4

THE EMPLOYMENT SYSTEM

AND

OCCUPATIONAL EDUCATION AND TRAINING

This chapter presents a survey of formal training practices in some of the employing establishments of the employment system. A considerable amount of time was devoted to discovering those establishments in three selected industrial areas which have training centers. The following analysis demonstrates that the employment system has some training practices that are similar to those of the educational system and the intervening training system. There are also some training practices for which nothing similar could be found in the other two systems. The great advantage of training by the employment system is that what is taught is used. There is no waste of skills learned. It is hoped that this survey will be helpful in finding a formula by which the educational and the intervening training systems can supplement what the employment system is actually doing or could do in the field of occupational education and training.

THE CASE OF THE RAILWAYS

The history of middle-level skilled manpower in this sector of the Tunisian economy is not greatly different from that of other sectors. Prior to independence, French and other foreign skilled manpower monopolized high and middle-level positions. Tunisians were mainly engaged in the lower-level jobs, and those among them who could be promoted were never given the chance; they were kept where they were and "trade secrets" were rarely disclosed to them [interview with director general].

The Railways Company was nationalized in 1956, and most of the foreign labor force left the country [Railways records]. The nationalized company found itself almost devoid of skilled manpower. Consequently, there was an urgent need to fill the technical vacancies with skilled Tunisians [Railways documents]. Several programs were improvised to meet the urgent immediate and future needs of the railways, especially needs related to operation, maintenance, and the manufacture of spare parts. The railways training program described below should be viewed against this historical background.

A formal training and education program built around apprenticeship is provided for those new recruits to the railways who have finished elementary education. A second formal training program of an upgrading type is given to workers who are engaged in the repair or the making of spare parts for engines and wagons. A third program offers various training activities to engine drivers and other employed workers in the form of correspondence courses, evening courses, and sandwich type upgrading courses.

One very important development in the occupational training and education program of the Railways Company is that it has recently become a training center for other employing establishments engaged in related technical activities. On visiting the training center at Sidi Fath-allah, Tunis, the researcher found twenty newly recruited trainees of the Civil Aviation Department being trained in the railways upgrading center. The twenty trainees had been scheduled to get their training in France, but the Railways Company is providing the training instead.

The Apprenticeship Center

The Apprenticeship Center is a modified form of the industrial sections of the college moyen. There are three important differences, however. First, the students at the center are committed for employment in the railways. Second, all the technical and general educational aspects of the program are directly or indirectly related to the skills needed in the railways. Third, the duration is two years for all, with a planned third year for a few students.

The program is limited to the children of employed, retired, or deceased workers of the railways. In a sense, the child has been living in the atmosphere of the occupation he is going to have, the trade of his father. The director of the Center emphasized that this is an advantage because the child comes to the Center fully acquainted with and oriented to the work habits of the railways. The researcher was told by the chief engineer that the Apprenticeship Center is a social service rendered by the company to the children of workers who cannot afford to continue their education in the educational system.

Presently, the Center has forty students, twenty in the first year and twenty in the second year. All have finished elementary education. The Center was started in 1965. At the end of the current year, the second year of operation, it will have its first graduates. The Center is located in the midst of the railways workshops, a few feet from the Upgrading Center. It has two sections, the workshop and the classroom.

First-year students get a monthly payment of six TDs while the second-year students get 10 TDs (one TD is two U.S. dollars) [Railways records]. All of them are day students, and many of them come from villages near the capital. Students and their guardians sign a contract according to which the student is required to work with the railways for ten years. Under this arrangement, the railways are sure to have the trainee with the Company for a considerable number of years. Furthermore, the fact that the whole training program imparts skills and knowledge related specifically to the railways makes the trainee bound to work in the place where he was trained. There is no temptation to change the place of work, at least for several years [interview with the director of the Center].

The curriculum of the training program is composed of 60% practical and 40% theoretical courses. The theoretical part includes French, mathematics, physics, mechanics, physical education, and technical education courses such as industrial design, general technology, and the technology related to the trade being learned. The workshop part concentrates mainly on fitting. Sixteen hours per week are allotted to the theoretical part and thirty hours to the workshop part of the curriculum (see Table 4-1).

Table 4-1

Weekly Program of the Railways
Apprenticeship Center

Courses	first year	second year
General Education		
Physical education	2 hrs.	2 hrs.
French	2 hrs.	2 hrs.
Mathematics	4 hrs.	4 hrs.
Physics, Mechanics	4 hrs.	2 hrs.
Technical education		
Industrial design	2 hrs.	3 hrs.
General technology	3 hrs.	2 hrs.
Trade related technology		1 hr.
Practical education		
Basic trade (ajustage)	30 hrs.	30 hrs.
Total	47 hrs.	46 hrs.

Source: Railways record.

The Upgrading Center

President Bourguiba inaugurated the opening session of the Railways Upgrading Center on July 12, 1957. The Center played an important role in occupational training because for some years it was the principal upgrading technical center supplying the Tunisian economy with middle-level skilled manpower.

The Center, from its inception on August 1, 1957 until October 10, 1959, was under the direction and supervision of the International Labor Organization [Railways records]. During this period the Center had an ILO appointed director and four instructors for the teaching of the technical courses. Presently, all members of the staff are Tunisians who were trained in France or other European countries.

The clientele of the Upgrading Center are already-employed workers who have had at least three years of academic background in the industrial sections of the *college moyen*. Originally the period of study was six months; now it is nine months. Training is in four trades: fitting, metal turning, milling, and diesel engines. At the end of the course of study, all trainees sit for an examination. Those who pass are promoted from the category of semi-skilled worker to the category of skilled qualified worker. Although a trainee signs a contract to work for ten years in return for the training, some of them do leave the railways for better pay or higher positions. Many of the instructors and administrators of the Office of Training and Employment are ex-trainees of the Railways Upgrading Training Center.

In this same Center a group of twenty newly recruited students to the Civil Aviation Department were receiving their upgrading training in metal fitting and diesel engines. Interviews revealed that the academic background of most of the Civil Aviation trainees is high compared with the academic background of the trainees of the railways. More than half of them have finished their technical secondary education (six years). The significance of this high academic background is that the Center is providing a kind of post-secondary technical training for these trainees. Moreover, it is an indication of the flexibility of the Center in meeting diverse training needs.

Between 1957 and 1965 the Center trained 388 skilled workers who were employed in the railways (see Table 4-2).

Table 4-2

Number of Graduates and Their Specializations

Category	Fitting	Metal Turning	Milling	Diesel Mechanic	Total
1957	18	9	3	10	40
1958	28	17	3	11	59
1959	27	8	4	20	59
1960	28	4	2	3	37
1961	24	10	5	16	55
1962	7	7	1	15	30
1963	9	10	5	-	24
1964	10	7	3	11	31
1965	18	13	8	14	53
Total	169	85	34	100	388

Source: Sidi Fath-allah Workshops records.

Further Training Programs

The railways company has also developed a system of in-service training that aims to raise the general theoretical education background of already-employed workers and to provide the drivers of engines with information about the make-up of newly developed imported engines. The further training system contains the following programs:

1. Correspondence courses. All employed workers have access to the correspondence courses. Subjects include technology, mathematics, physics, chemistry, industrial design, and subjects related to the technology of railways. The courses are not advanced and are specially designed to meet the needs of workers who have had some elementary education. Most of those who enroll in the correspondence courses are drivers of the locomotives. The director of the program, an elderly Frenchman, told the researcher that almost 50% of those who enroll finish the program. Some of the participants drop one course to enroll in another. A worker can enroll in one or more of the courses offered. No fees are charged. All costs are borne by the railways company.

2. Drivers' morning course. Six-week courses are conducted in the morning for several groups of drivers. There are initial courses for the newly recruited drivers and others for experienced drivers who are going to drive newly imported engines. Since the company imports engines from several foreign countries, it has been customary to conduct these training courses as needed.

Drivers are taught both how to run and how to repair the engines. After every course on a new engine, a worker is given a license signifying that he passed the relevant course. On this basis the older the driver, the more licenses he holds. The researcher interviewed two of the fifteen participating drivers during a visit to the railways training center at Farhat Hached Depot. One of them has had fifteen years of experience and has five driving licenses, while the other has had ten years of experience and has three driving licenses. Both of them have had some correspondence courses in mathematics, French, and electrical work. All costs for this type of training are borne by the company. The courses are given in the training center of Hached Depot, Tunis. There are a senior French director and two Tunisian instructors. Both of the Tunisians hold the technical secondary education diploma and have had some training in France. An instructor usually has six months of actual work-experience in all sections of the railways workshops before he begins teaching.

3. Evening courses. Evening courses are open mainly to those who want to qualify for the examinations required for promotion to higher ranks. Many of those who participate in these courses have either the BEM or the older form of this diploma that was in existence before independence, the CAP or Certificate d'aptitude Professionelle. The courses are scheduled in such a way that half the time is taken from the regular working day while the other half is the worker's own time.

Table 4-3

Further Training Programs and
the Number of Graduates

Category	Drivers' Morning Course No. of Trainees	Evening Courses No. of Trainees	Correspondence Courses No. of Trainees	Total
1965	19	69	25	113
1966	20	55	36	111
1967	46	32	12	90
Total	85	156	73	314

Source: Grand Depot, Ferhat Hached, Railways Records.

Conclusion

Occupational education and training programs of the railways company provide an example of how the employment system can provide specific training for already-employed workers as well as for workers just at the point of employment. The programs offered by the company suggest alternative ways to do what the educational system and the intervening training system are doing in the field of specific training. Furthermore, this is a case where there is no waste; skills learned are utilized.

THE CASE OF THE CEMENT FACTORY

Formal training also exists in the El-Bouniane Building Company, a group of sixteen plants in the public sector. The total labor force of the company is 3000 [interview with El-Bouniane training officer]. One of the major plants of the company is the cement factory located in the outskirts of Tunis in the Jebel El-Julud industrial area. The labor force of the cement factory is about 600 workers; all are Tunisians with the exception of a few highly skilled foreigners, some of whom are supervising the construction of a new furnace. Like the railways company, the cement factory has a post-elementary occupational training program and an upgrading training program. There are, however, some differences between the programs of the two establishments.

Post-Elementary Occupational Training

Interviews with some of the workers disclosed the fact that the factory formerly had a formal training program for newly recruited workers with an elementary level education. The program ran for three years ending in 1961. It provided both technical and general education as well as workshop training. The interviewed workers stated that the program aimed at giving education and training similar to that of the industrial section of the college moyen, except that the practical part of the factory center program gave training in skills related to the needs of the cement factory. The program seems to have been similar to the post-elementary education and training of the railways apprenticeship center, with one important difference. The practical training of the railways is given in special workshops, while that of the cement factory was given in the workshops of the factory itself -- that is, in actual work situations.

Presently the cement factory conducts a post-elementary occupational training program which is a modification of the program which ended in 1961. Instead of accepting students with elementary education, as is the case with the railways company, the cement factory accepts the graduates of the centers of preapprenticeship of the intervening training system. Thus, the trainees have elementary education plus one year of preoccupational training in the preapprenticeship centers. The new program is the first attempt by the employment system to coordinate its efforts in the field of occupational education and training with both the intervening training system and the educational system.

Upgrading Training Program

Another program upgrades the graduates of the industrial sections of the college moyen. This program is similar to the upgrading program of the railways company. The director of the center told the researcher that the upgrading curriculum is built on an intensive study of the various tasks and jobs required in the cement factory. These are transformed into curriculum contents. The main focus is on those points at which workers have accidents which result in injury, damage to machines, or slackening in production.

The program of upgrading contains general and technical theoretical education such as French, Arabic, mathematics, industrial design, general technology, trade related technology, repair shop technique, and human relations. The human relations course attempts to make the new working generation, which is more educated and technically trained, more considerate of their work-companions who are less educated or even illiterate.

Literacy Campaign within the Factory

A third in-employment educational activity of the cement factory is the evening courses in reading and writing for illiterate workers, an effort undertaken by few establishments in Tunisia. [The Ministry of Information is the agency responsible for fighting illiteracy]. More than 50% of the factory's workers are illiterate [factory records]. The number of participants in the literacy program is eighty for the year 1967/68 [factory records]. Some of the participants are attending the program for the second year, and they are offered courses more advanced than the basic skills of reading and writing.

Table 4-4

Number of Participants in the Various Training and Educational Programs of the Cement Factory

Category	Apprenticeship	Upgrading	Literacy	Total
1963/64	6	50	-	56
1964/65	9	40	68	117
1965/66	12	38	40	90
1966/67	16	31	80	127
Total	43	159	188	390

Source: Records of the factory.

New Plans

Discussion with the training officer brought out an important issue facing the El-Bouniane Building Company. Although the training center is now concerned mainly with the training of workers who are already employed or committed to work in the cement factory there are a few workers from the other plants of the company who are being trained in the center. The issue being discussed is whether to establish similar training centers in the other plants in order to facilitate training of more workers. One justification for the establishment of training centers in the other plants is that most of them are not conveniently located near the cement factory.

The researcher is of the opinion that a distinction in planning should be made between the post-elementary apprenticeship program and the upgrading program. It would be workable to decentralize the apprenticeship program because the practical part of the curriculum is conducted in actual work situations in the plants. However, because the practical part of the upgrading program is conducted in a specially designed workshop, it is better to have only one center that will serve workers of the various plants.

THE CASE OF THE GAS AND ELECTRICITY COMPANY

The following discussion offers evidence that an employing establishment sometimes trains recruits who already are skilled workers to whatever new skills are required for that establishment. Though the new recruits have had various types of training, either in the schools of the educational system or in the training centers of the intervening system or in both, the training offered by the employing establishment is not necessarily based on the specific skills component of the curriculum of the school and the center. In fact, the training offered by the employment system, as will be demonstrated, is based on the common general theory component of the curriculum, which is scientific, mathematical, and technological. The specific skills component of the curriculum that was acquired in the schools and the centers is replaced by other specific skills that are directly related to the current needs of the employing establishment.

The employing establishment is the Gas and Electricity Company of Tunis. The Company recruits its middle-level manpower either directly from the educational system or from the Electricity Upgrading Training Center of the Office of Training and Employment located in Tunis [CIPE, Centre d' Instruction et de Perfectionnement d'Electrotechnique]. The graduates of the Center are employed not only in the Electricity Company but also in some thirty-six other establishments in Tunisia [CIPE records].

Thus, the interviews conducted in the Company include graduates of CIPE and others, while some graduates of CIPE were also interviewed in other establishments.

It is pertinent to analyze the Electricity Upgrading Training Center of the intervening training system before presenting the analysis of the in-employment training of the Gas and Electricity Company.

The Electricity Upgrading Training Center (CIPE)

The Center was established in 1959 with the main function of upgrading the training of students who have the CAP (Certificat d'Aptitude Professionnelle) in specific electrical trades. From its inception in 1959 to the present time, the members of the technical teaching staff of the Center have been lent by the Gas and Electricity Company. The salary of the staff formerly was paid by the Ministry of Social Affairs and is presently paid by the Office of Training and Employment. Another link between the Company and the Center is that the Company used to pay six TDs per month to every trainee in the Center. Since not all graduates are to be employed by the Company, the payment of the six TDs by the Company to each of the trainees was stopped this year [interview with employed workers and Company officials]. The trainees get 14 TDs per month from the intervening training system. The Company is also unhappy about the fact that it is staffing a center that is not totally geared to its own purposes.

Table 4-5

Trainees of the 16th Group

Year of birth	Number of Students	%
1944	1	1.4
1945	1	1.4
1946	3	4.3
1947	13	18.6
1948	45	64.3
1949	6	8.6
1950	1	1.4
Total	70	100.0

Source: CIPE records.

Trainees from 18 to 35 years of age are accepted into the Center. However, most of them are 19 to 21 years old (see table 4-5). This phenomenon of the prevalence of young people in what is supposed to be an adult education and training institution is a characteristic of all training centers in Tunisia.

An applicant has to have either the BEM or the CAP with specialization in electricity, metal fitting, general mechanics, or three years of the Lycee Technique. The Center trains two groups, each composed of 71 trainees. The first group joins the center in September, the second in January of every year. The course of study is eleven months for each group. There are at present the following five fields of specialization: radio and TV, refrigeration, gas distribution, industrial electricity, and electrical networks. From its establishment in October 1959 to December 1967, the center has admitted 525 trainees of whom 408 received diplomas [CIPE records] (see Table 4-6).

Table 4-6

Number of Graduates of CIPE

Category	Initial Year	Number Admitted	Number Diplomas Received	Number Drop-out	% Diplomas Received
Electrical central	1959°	20	19	1	95
Electrical network	1959	206	159	47	77.1
Industrial electricity	1959	196	146	50	74.4
Gas distribution	1964	51	39	12	76.4
Refrigeration monitor	1965	28	23	5	82.1
Radio repair	1966	16	15	1	93.7
TV repair	1966	8	7	1	87.7
Total		525	408	117	

Source: CIPE records. ° = stopped in 1960.

The students who dropped out or who failed in the final examination account for the difference between the number of trainees admitted and the number of those who successfully finished the course of study. The number of trainees dropping out is greater than the number of those who fail in the final examination. Dropping out normally takes place in the first three months when a student discovers that electricity is not the field for him. In some cases the Center asks a student to drop out [interview with the director of CIPE].

According to the interview with the director of the Center, all graduates of CIPE find immediate employment. He claims that the demand for the graduates comes from many establishments before graduation. The demand normally exceeds what the Center can supply. In 1967, for example, the Center received demands for 50 industrial electricians, but it could supply only 18, and demands for 37 refrigeration monitors but could supply only 15. In the other fields of specialization, the demand was almost matched by the supply [CIPE records].

As to the correspondence between the training background and the actual work done by the graduate, a report on The Utilization of the Graduates from Technical and Vocational Training Institutes in Tunisia prepared by a Danish social scientist for the Ford Foundation's Tunisian representative states that "The graduates from CPP centres, the most advanced of the SEJSAS [Ministry of Social Affairs] centres, of which CIPE is one, have found occupations which seem to correspond very well to the education received" [1966:6]. Also, the report's finding that "only very few of the CPP (upgrading centers) graduates are unemployed" supports the director's testimony about employment of the graduates of his Center [1966:6].

Nevertheless, finding CIPE graduates working in the Gas and Electricity Company or in similar establishments does not necessarily mean that what has been learned at the Center is utilized completely by the graduates in the performance of their jobs. Also, finding a graduate of the industrial section of the college moyen with electricity as a specialization working in an electrical company does not necessarily mean that the worker is utilizing what he has learned at school in performing his present job.

A study of the workers' school and training background and the nature of the skills they are using in their current jobs would determine the training role of any of the three training systems. This also would determine what part of the school and Center curricula has helped the worker in acquiring the new skills while employed, if he has acquired such new skills. The training role of the Gas and Electricity Company is performed, according to the findings that follow, either formally or informally. Formal training refers to programs at the training center located at Halq El-wad Power Station of Tunis. Informal training refers to the on-the-job retraining activities carried out in conjunction with regular operations. The second type of training was found in the gas station section of the Company in Tunis.

The Power Station Training Center

Since 1963, the Company has been conducting an annual training program in which new and old workers in the power station section have participated. The assumption underlying the training program is that specific skills needed for the operation and maintenance of newly constructed generators are not normally given either in the industrial sections of the schools or in the training centers of the intervening system. Trainees attend a full-time, one-year program in which they are given theoretical courses concerning the generators. Concurrently, they get on-the-site experience with actual construction and operation of the generators.

There were 16 trainees at the time the researcher visited the training center. Eight of the trainees were randomly selected for individual interview. The findings revealed the role of each of the three systems, the educational, the intervening, and the employment:

1. Educational system background. The eight trainees had four different specific skills background. Three of them had studied electricity.

2. Intervening system background. Three of the eight trainees attended the intervening centers after which they joined the power station. The other five joined the company directly from the schools.

3. Employment system background. At the time of the visit, the eight trainees were learning completely new specific skills (for one year) in the training center of the power station.

Discussion with the interviewees and the chief engineer suggests that only the general theory and general skills components of the curriculum, that is, the general technological and scientific background of the students, are being utilized in the employment system training. Science and technology as a background make the workers trainable and adaptable. All interviewees stated that industrial design and mathematics and, for some of them, technology are the courses that are being utilized in learning the contents of the in-employment training curriculum.

Informal Training in the Gas Section of the Company

The gas station contains two main departments, the distribution networks and the laboratory. Six workers randomly selected from both departments were interviewed. Their educational backgrounds were not homogeneous. Three of them had general education, the other three had different industrial specializations, one of which was electricity. After three years in the college moyen or the secondary school, all went to the electricity center, CIPE, where four of them specialized in gas plumbing and two in electrical networks. In the employment system only two of the plumbers were utilizing what they had learned at CIPE. The other four workers learned a new set of specific skills in the laboratory through the system of on-the-job training.

Three of the four who learned new specific skills became laboratory technicians. These stated that the parts of their education that are being utilized are, first in importance, chemistry and, second, mathematics. They also stated that some of their work-companions who had not been interviewed also spent the first few months in an on-the-job training period. The specialized training they got in the center of the intervening system is not being utilized. As for those who are in the gas distribution networks department, they stated that the plumbing courses they had learned at CIPE were useful. But, even so, it could be advocated that the Company conduct a short training program in plumbing, leaving general education only to the educational system.

THE CASE OF THE CIVIL AVIATION AND METEOROLOGY DEPARTMENT AND THE MERCHANT NAVY

The Public Works Ministry has several training programs that are designed to meet the middle-level skilled manpower requirements of some of its specialized departments. Two types of training activities are discussed in this and the following section. The first is the Civil Aviation and Meteorology Department Training Center at Carthage, near Tunis. The second is the Merchant Navy Training Center at Sousse.

The type of training provided in these establishments has the advantages of any in-employment training arrangement. First, there is the direct link between training and employment in that the training enables the trainee to acquire the skills to be utilized in performing his job. In other words, there is no waste of specific skills. Second, the training centers located in employing establishments appear to maintain simpler workshops than are found in the other two systems.

The programs offered by the Public Works Ministry differ, however, in one respect from the other formal in-employment arrangements discussed; they recruit most of their trainees from the fourth, fifth, or sixth year of the mathematical technical option of the technical section of the secondary school. This option differs from the industrial sections of the _college_ _moyen_ or the industrial option of the secondary schools in one important respect. It gives more time to technical-scientific theoretical foundations and less to workshops. Furthermore, the recruited trainees have a higher level of educational attainment. In brief, the present arrangement has the advantage of getting recruits who, although they are drop-outs, have almost finished their secondary education and have a broad scientific and technical theoretical foundation plus some workshop training.

The Case of the Civil Aviation and Meteorology Department Training Center

The training center for Civil Aviation and Meteorology personnel was started by the Tunisian Government in 1958 with the help of ICAO, the International Civil Aviation Organization, and WMO, the World Meteorological Organization [United Nations Activities in Tunisia:4]. The Center was started with three fields of specialization: air-traffic control, meteorology, and telecommunication. Starting in 1961 the United Nations Special Fund helped the Center to extend its training activities to include four fields: (1) Training civil pilots, (2) Air-traffic control, (3) Meteorology, and (4) Radio and radar techniques [Center records].

The Center now has trainees from other African countries as well as from Tunisia (see Table 4-7). Enrollment in the Center has been steadily increasing since its inception in 1958. It started with 15 trainees and currently (1967/68) has 130 (Table 4-8). Four Tunisian girls are specializing in meteorology and telecommunication.

Table 4-7

Trainees by Country

Country	Number of Trainees
Algeria	46
Burundi	10
Congo Brazzaville	4
Cameroon	1
Ghana	1
Guinea	30
Kenya	1
Mali	8
Morocco	151
Malagasy	1
Mauritania	5
Nigeria	2
Senegal	1
Tunisia	564
Total	825

Source: Center Bulletin, p. 3.

Table 4-8

Number of Trainees in the Center

Category	Number of Trainees
1957/58	15
1958/59	16
1959/60	74
1960/61	80
1961/62	105
1962/63	100
1963/64	143
1964/65	142
1965/66	155
1966/67	160
1967/68	130
Total	1120

Source: Center Bulletin:3.

With the exception of the training of civil pilots, which takes 18-24 months, the training programs require one year. Training in the four fields other than flying is conducted on two levels. The first is for assistant technicians and the second is for lower assistant technicials. The minimum requirement for the higher level is five years of secondary education and for the lower level three years of secondary education. There is no specification in the admission requirements for any of the three sections of the secondary school, the general, the technical, or the economic. However, most of the students who pass the entrance examination are from either the general section or the mathematical-technical option of the technical section of the secondary school [interview with director and students]. Thus, mathematics is the most useful discipline and, to lesser degrees, physics and industrial design [interview with trainees and director].

Seven trainees were randomly selected for the interview. Five trainees were from the mathematical option of the general section of the industrial school, and two were from the mathematical-technical option of the technical section. Two interviewees were specializing in air-traffic control, two in telecommunication, and three in meteorology. All the interviewees stated that mathematics is the discipline that is most helpful to them in understanding their new courses in the center. They emphasized that the scientific general education is the foundation upon which they are building their new technological training and knowledge. Interestingly enough, the two interviewees from the technical-mathematical option who took seven hours a week in the school workshop stated that their experiences in the school workshop were not needed in their present training. Their contention is supported by the fact that their classmates from the general section had little workshop training at school and have done as well, based on their own opinions and the judgment of their supervisor.

The Civil Aviation Training Center is an example of the possibilities in training recruits with mathematical and scientific background and little or no previous workshop training to technological middle-level skilled manpower tasks.

Civil Aviation Trainees in the Railways Training Center

As was mentioned earlier in the chapter, fifteen workers of the Civil Aviation Department are being trained in the railways training center. Of the fifteen trainees, at least seven had been in either the technical-mathematical option or the general section, both of which offer little pre-employment workshop training. Those who had been at school in the industrial option of the technical section had about 18 hours per week of workshop training in the last three years of their six years of secondary education. Nevertheless, the mere existence of trainees with two different school workshop backgrounds who are currently being trained for the same jobs and taking the same training program is an important fact. The training instructor stated that the trainees who do not have workshop backgrounds are as successful as the ones who do in acquiring the new curriculum contents at the training center. Those of the mathematical-technical background are even more promising, he feels, because of their more solid scientific and mathematical education. All of this raises the question of whether an intensive workshop training is a prerequisite for successful in-employment formal training.

The Case of the Merchant Navy Training Center

The training center for the Tunisian merchant navy was established in 1966/67. Its main function is to train young Tunisians for middle-level positions in the merchant navy. There are two main fields of specialization, the training of deck officers and the training of ship mechanics. Students are trained in each field for various levels of proficiency. There are at present eighty trainees all of whom are Tunisians [Center Records].

The Center recruits its trainees mainly from the secondary schools. Students from the third to the sixth secondary grades are eligible to participate in the entrance examination required for admission. The subjects required in the examination are mathematics, physics, electricity, industrial design and French [Records of the Center].

As is the case with trainees in the Civil Aviation training programs, most of the students who pass the entrance examination are either from the mathematical-technical option of the technical section or from the general section with mathematics as their field of concentration. All of those who are being trained to be deck officers are from the general section with mathematics or science as the field of concentration [interview with director]. The situation is different for ship mechanics. Here the students are of varied backgrounds. There are students from the industrial option of the technical section who have had 18 hours per week of workshop training. There are students who are from the mathematical-technical option who have had only seven hours per week of workshop training. Of three interviewed trainees from the mechanical section, one has a background in general education, one in science, and the third in general mechanics. The researcher was told by the director that such varied educational backgrounds is typical. All trainees are acquiring the required mechanical skills at the Center. Interviewees agreed that mathematics and physics help them in acquiring the new job-related knowledge and specific skills.

Training in the Center is but the first step for another step undertaken outside the Training Center. For the first nine months, trainees of the several levels of the two fields of specialization take theoretical trade-related courses and some workshop practical training. On visiting the several workshops, the researcher observed that the equipment was of low cost as compared with the high-cost equipment seen in the workshops of the educational and intervening systems' centers and schools. The reason for the simple equipment is that actual practice is arranged on a post-center training basis. After the first nine months all participants become members of the crews of merchant navy ships on which they spend from 12 to 48 months, depending upon the level of proficiency sought by the on-the-job training. After this period of actual training, the participants sit for the theoretical and practical examination which qualifies them for the diplomas.

The training practices of the Merchant Navy Center give further evidence of the possibilities in training employees with minimum pre-employment workshop experience for mechanical as well as purely technical jobs. Furthermore, this type of in-employment training is made possible by the scientific-mathematical general education of the students. The training practices of the Center also provide further evidence that many of the skills needed for a job can be provided at the point of or after employment.

THE OCCUPATIONAL TRAINING TAX

The Occupational Training Tax was instituted by the Tunisian government in 1956 [Code De Travail:1966:113]. The aim of the tax is to finance the training activities undertaken by the government and, by appropriate exemptions, to stimulate training activities by employing establishments. The revenue from the tax was formerly deposited in a fund called "The Occupational Training Fund." The tax required that employers pay 1% of the wages and salaries paid to all employees of their establishments. The tax usually could not cover all the costs of the training activities undertaken by the government [interview with tax officer:Rades]. The deficits in the training fund were covered from government sources. Presently, the training tax revenue is incorporated in the national budget. An important development was the increase in the amount of the tax from 1% to 2% starting in 1966 [interview with tax officer:Rades].

Exemption from the Tax

So far it is clear that some of the establishments of the employment system in Tunisia undertake various types of occupational training activities. Several of these activities are carried out in conjunction with the Office of Training and Employment. All establishments undertaking one or more of the following training activities are exempted from the tax to an extent equivalent to the cost of the training programs undertaken:

1. Training centers in establishments
2. Training of workers abroad
3. Offering training facilities for interns
4. Offering training facilities for apprentices

The usual procedure is for the employing establishments to apply to the Office of Training and Employment for exemption. The researcher was told by the tax officer that exemption from the tax is an incentive for employing establishments either to start their own training programs or to cooperate with the Office by offering training facilities for the interns sponsored by it.

The Office of Training and Employment requires that the employing establishments' training programs meet the minimum standards specified by the Office. The Office is ready to offer help with the training of instructors and the construction of curricula and teaching materials to employment system establishments desiring to set up training programs.

PART TWO

Utilization of Training, Appropriateness of Curricular Contents and Benefit/Cost Analysis

INTRODUCTION

Part One presented an analysis of the three systems that undertake occupational education and training in Tunisia, namely, the educational system, the intervening training system, and the employment system. The rationale for this arrangement, according to advocates of the three systems, is that each system complements the others in its activities. The researcher, on the other hand, hypothesizes that there is some unnecessary duplication of functions among the three systems, and that they might serve the country's needs more effectively and economically if there were a redefinition of their respective functions in the light of the relations of their programs to each other and to the qualifications required in the jobs filled by their graduates. Such a redefinition could best be accomplished after an analysis of (1) actual utilization, in jobs filled by graduates, of various curricular components offered in the three training systems, and (2) comparative costs and benefits of training provided in the three systems. It is to such an analysis that, it is hoped, Part Two will contribute.

Chapter 5 presents the results of follow-up studies of graduates of the various education and training programs in order to throw light on the utilization in their present employment of the preparation received in schools or centers.

Chapter 6 studies the costs of the various education and training programs and applies some of the techniques of benefit/cost analysis for comparative purposes.

CHAPTER 5

THE GRADUATES IN THE EMPLOYMENT SYSTEM

RELATED RESEARCH STUDIES

Erling Jørgensen, a Danish social scientist, carried out a survey in Tunisia on utilization of the graduates of institutions providing vocational-technical training (1966). The survey was a part of a Ford Foundation project on "Strengthening of Industrial Manpower Training in Tunisia." The survey attempted to answer two main questions: The first, to what extent is this expensive and scarce training being put to practical use in industry? The second, does the training imparted correspond to the practical needs of industry?

A sample of 918 graduates from (1) the accelerated training centers, (2) the upgrading training centers, (3) the college moyen schools, and (4) the lycee technique schools was drawn. The graduates in the sample were interviewed by Tunisian counselors with a questionnaire. The following results were obtained:

1. The graduates of the upgrading centers have found occupations which seem to correspond very well to the training received. Very few of these graduates are unemployed or employed outside their trades.

2. The graduates of the accelerated training centers are characterized by a very substantial rate of unemployment. Among those graduates who have succeeded in getting employment, the pattern of occupation seems to correspond well to the training.

3. "The graduates from lower secondary technical schools (college moyen) are more spread among the different occupations."

4. The graduates of the secondary schools, lycee technique, apparently consider this education as a preparation for higher education. Few of them were found in the labor force.

The survey report gives the following general conclusion: "Whereas about 75 per cent among the CPP (upgrading centers) and FPA (accelerated centers) graduates who are actively employed state that their present occupation corresponds to their former education, this holds only for about 55-60 per cent of CM (college moyen) graduates."

The findings of the Jørgensen survey are only partially supported by the findings of the present research, and in certain respects issue must be taken with them. At the least, a different emphasis in interpretation of the findings is called for. The survey examined the occupational preparation of the interviewed workers only from the point of view of their industrial-technical school or training center background [Jørgensen:1966:10]. By interviewing only workers with this background and not examining the complete education-training of a sample of workers performing similar jobs, the survey could not determine the respective training roles of schools, centers, and employing establishments. The present research demonstrates that a skilled worker can be a product of the educational system only, a product of the educational and the intervening systems, a product of the educational and employment systems, or a product of the educational, the intervening, and the employment systems. The main findings of the present research reveal the decisive role of the employment system in providing specific, job-related skills.

Because of the research methodology followed by the Jørgensen study -- the use of a sample drawn exclusively from graduates of the industrial or technical sections of schools and centers -- the role of the general education sections of the schools has been overlooked completely. Since the research involved only technical graduates, its conclusions concern these graduates only. The present researcher holds the hypothesis that the general education provided in the schools operates in conjunction with the in-employment training activities of the employing establishments to supply the market with skilled manpower. This hypothesis was supported in an earlier case study undertaken in Jordan [Al-Bukhari:1968].

The Jørgensen study states that "it is very difficult to measure the degree of utilization of education" [Jørgensen:1966:13]. To the present researcher this point is an important issue. To say that a graduate is or is not "utilizing" his education is not enough. An education is usually embodied in a curriculum, a curriculum composed of contents, and these contents can be broken down into components. Accordingly, it is important to raise the question, which parts of the graduate's education and "training" are utilized? The answer to this question, not dealt with in the Jørgensen study, is sought in the present research and has important policy implications.

Hence, the present study differs from the Jørgensen survey in two important respects. First, the interrelated roles of the schools (general as well as industrial sections), the centers, and the employing establishments in the preparation of skilled workers are examined and emphasized. By drawing samples from the employing establishments, it was possible for the present researcher to interview workers who are not graduates of technical institutions in addition to those who are and, thus, to determine the role of general education and the general sections of the schools. Second, the curriculum is divided into four components, thus making it possible to "measure the degree of utilization of education" in more meaningful detail.

With these variables, the comparative costs analysis and also the comparative benefit/cost analysis were possible. These differences in the two studies have important implications for policy-making. A policy maker must consider all variables if he is to arrive at valid decisions on the most favorable lines of action to be chosen from among several alternatives.

INTERVIEW METHODOLOGY OF THE PRESENT RESEARCH

Approach and Definitions

After spending a considerable time exploring the field in which the research was to be conducted, the researcher found that a suitable approach was

1. To select a certain number of industrial areas that represent all phases of industrial development in Tunisia,

2. To select within each industrial area a certain number of employing establishments that would serve the purposes of the research project,

3. To interview in each selected employing establishment randomly selected samples of the following seven categories of workers, designated by the symbols shown:

-A- Apprentices who are being trained or have recently finished training in employing establishments. These apprentices completed their elementary education and then joined an employing establishment.

-PA- Apprentices who spent one year of preemployment training in the preapprenticeship centers of the intervening training system after completion of their elementary education and before joining the employing establishment.

-M- Workers who are graduates of the industrial sections of the college moyen, or are drop-outs of the final year of the same institution, or drop-outs of the third year of the industrial or general sections of the secondary schools.

-F- Graduates of the accelerated training centers.

-P- Graduates of the upgrading centers.

-S- Workers who have had at least five years of secondary education in any section.

-I- Workers with incomplete elementary education.

The Three Industrial Areas Selected

Three areas were selected for the field research: Tunis, Bizerte-Menzel Bourguiba, and Sousse. The Tunis area contains all types of employing establishments ranging from small workshops to modern factories. Most significant, it has the central government ministries that are the major employers of the graduates of the educational system. The Bizerte-Menzel Bourguiba area is well known for a concentration of modern industrial complexes that are publicly owned. Sousse represents the industrial decentralization policy followed by the government. Table 5-1 is a summary of the approach in terms of areas, establishments, public or private, and the number of workers interviewed.

Table 5-1

Number of Establishments
and Workers Interviewed

Selected Areas	Number of establishments Visited		Number of workers Interviewed	
	Private	Public	Private	Public
Tunis	15	5	95	84
Bizerte-Menzel Bourguiba		4		28
Sousse		3		36
Sub-total	15	12	95	148
Total	27		243	

Source: Interview survey of 243 workers in Tunisia

Sampling Techniques

1. The private sector: In private sector establishments with less than 150 workers, workers interviewed represent all the workers of their categories in each establishment. In establishments with more than 150 workers, the workers interviewed were randomly selected by the researcher, although in some cases the recruitment or training officer participated in the process of selection (see Table 5-2).

Table 5-2

Labor Force of Each of the Private Sector Establishments Visited and the Number of Workers Interviewed in Each

Establishment	Total Labor Force	Number Interviewed	% Interviewed
Metallic construction	50	5	10.0
Tankers construction	150	4	2.7
Wet batteries	47	6	12.8
Lime mining	200	4	2.0
Foundry	200	3	1.5
Car service and maintenance	44	8	18.2
Citroen car service	25	6	24.0
Furniture making	17	4	23.5
Peugeot car service	85	9	10.6
Mechanical spare parts manufacture	25	4	16.5
Bookcase and handbag factory	50	5	10.0
Simca car service	50	5	10.0
Renault car service	95	10	9.5
Women's dress factory	20	8	40.0
Printing press	70	14	20.0
Total	1128	95	8.4

Source: Interviews with employers and workers.

2. The public sector: Five of the twelve public sector employing establishments were found to have their own training centers. The clientele of these centers are employees in the establishments, with the exception of the Railways Training Center which also has trainees from the Civil Aviation Department. In such establishments, the interviewees were randomly selected from among the trainees currently being trained in the centers (see Table 5-3). The other seven establishments in the public sector have no training centers, and the interviewees were randomly selected in each establishment.

Table 5-3

Number of Trainees Interviewed in each of the Establishments Having Training Centers

Establishment	Total Number of Trainees	Number Interviewed
Civil Aviation	130	12
Railways	40	19
Gas and Electricity	20	14
Cement factory	31	11
Merchant Navy	80	6
Total	301	62

Source: Interview survey of 243 workers in Tunisia.

Categories of Workers Interviewed in the Three Areas

As was expected, not all categories of workers were found in every establishment. Tables 5-4, 5-5, and 5-6 show the number and distribution of workers interviewed in each of the categories of the three selected areas. The distribution of workers of the various categories in the Tunis areas is interesting. It shows a general trend there toward more of the I, A, and PA workers in the private sector establishments and more M, F, P, and S workers in the public sector establishments.

Table 5-4

Workers Interviewed in Tunis Area, by Categories

Establishment	Sector	I	A	PA	M	F	P	S	Total
Metallic construction	Private	2	2	1					5
Tankers construction	Private	2		1				1	4
Wet batteries	Private	6							6
Lime mining	Private	2	2						4
Foundry	Private		2		1				3
Car service and maintenance	Private	3	2	2					7
Citroen	Private		3	3					6
Furniture making	Private		2	2					4
Peugeot	Private		5	3		1			9
Spare parts manufacture	Private		1		2			1	4
Bookcase and handbag factory	Private		3		2				5
Simca	Private		3		1		1		5
Renault	Private		2	1	3	2	2		10
Women's dress factory	Private		4		4				8
Printing press	Private	2	2	1	3	2	4		14
Civil Aviation	Public				1			11	12
Railways	Public		1		5		8	5	19
Gas and Electricity	Public				5	1	7	1	14
Cement factory	Public		1	1	3		5	1	11
M. Communication Workshops	Public		1	8	9	3	5	2	28
Total		17	36	23	39	9	32	22	178

Source: Interview survey of 243 workers in Tunisia.

Table 5-5

Workers Interviewed in Bizerte-Menzel Bourguiba Area, by Categories

Establishment	Sector	I	A	PA	M	F	P	S	Total
Refinery	Public		2		2		1		5
Clothing factory	Public		2		2		1		5
Iron and steel factory	Public				5	4		1	10
Naval arsenal Workshops	Public				6		2		8
Total		0	4	0	15	4	4	1	28

Source: Interview survey of 243 workers in Tunisia.

Table 5-6

Workers Interviewed in Sousse Area, by Categories

Establishment	Sector	I	A	PA	M	F	P	S	Total
Merchant Navy School	Public				1	1		4	6
Car assembly plant	Public		2	4	4		2	3	15
General tools manufacture	Public		1	2	4	2	3	3	15
Total		0	3	6	9	3	5	10	36

Source: Interview survey of 243 workers in Tunisia.

Table 5-7

Summary of Workers Interviewed,
by Category and Area

Area	I	A	PA	M	F	P	S	Total
Tunis	17	37	23	39	9	32	22	179
Bizerte	--	4	--	15	4	4	1	28
Sousse	--	3	6	9	3	5	10	36
Total	17	44	29	63	16	41	33	243

Source: Interview survey of 243 workers in Tunisia.

CURRICULUM COMPONENTS AND THE METHODOLOGY OF RATING THEIR UTILIZATION

The method of rating curricula discussed below is used for the 63 workers of category (M) (three years of industrial school background) and for 16 of the 33 workers of category (S) (more than four years of secondary industrial education). This method is not used for the other categories of workers. For the (F) and (P) categories (graduates of the upgrading and accelerated centers respectively), the researcher focused on one important question, whether there was duplication of learning or divergence to new trades between the educational system and either of the other two systems.

The Four Curriculum Components

The curriculum of the industrial sections of the college moyen and of the full secondary schools in Tunisia provides the students with skills and knowledge which can be divided into four components, two of which are specific in nature and two of which are general. The four components are these:

1. The specific skills component. This represents all trade-related skills. Specific skills for the various trades are learned in the workshops.

2. The specific theoretical component. This component is composed of technological and trade-related theoretical courses: technology, applied mathematics, industrial design, and labor laws.

3. The general skills component. This component refers to the general skills acquired that are applicable and transferable to a wide range of trades. Included in this component is the general orientation given in the first year to the students in the workshops.

4. The general theoretical component. This component is both scientific and literary. Languages, both mother tongue and foreign, religion, mathematics, physics, history, and geography are included.

This research attempts to determine for the workers of the (M) category and for the 16 workers in the (S) category who have industrial school background:

(a) Which of the four school-learned curriculum components are being utilized in the jobs held by these workers and which ones are not utilized and thus "wasted."

(b) What new curriculum components, substitutes for the unutilized ones learned in school, have been acquired in employment by formal training or by informal means and are being utilized in the workers' jobs.

In other words, the purpose is to analyze the respective roles of the industrial sections of the schools and the employing establishments, under present arrangements, in the preparation of workers for middle-level manpower positions.

The Rating Method

It is important to determine the degree of relationship between the trade learned in school and the present job. For this purpose, information was obtained in interviews with workers and was supplemented and checked by direct observation and by interviews with supervisors and personnel officers. Each of the four curriculum components was given a positive or a negative sign in the sample, depending upon whether or not the worker utilized this component. Thus,

1. If a worker is utilizing all four curriculum components, the rating is four positive signs, and his education at school is judged to be closely related to his present job. Workers getting four positive signs are grouped in the closely related category, designated CR (Closely Related).

2. If a worker is utilizing two or three components and has acquired one or two components by formal or informal in-employment training and experience, the rating is two or three positive signs, and his school education and training is judged to be broadly related to the job. Workers getting either two or three positive signs are grouped in the broadly related category, designated BR (Broadly Related).

3. If a worker is utilizing one school-learned component and has acquired the remaining components by formal or informal in-employment training and experience, the rating is one positive sign. The school curriculum is judged to be unrelated to the present job. Workers getting one positive sign are grouped in the unrelated category, designated UR (Unrelated).

The researcher discussed with each worker the nature of his job and the skills and the theoretical knowledge utilized. Usually the worker could state which of the four components were useful to him and what components learned in the employing establishments were substitutes for the unused school components. In most cases it was possible for the researcher to visit the worker in his actual work situation and to check by personal observation some of the judgments obtained in the interviews. Employers and work-supervisors were also consulted when possible.

WORKERS WITH THREE YEARS OF POST-ELEMENTARY INDUSTRIAL EDUCATION: CATEGORY (M)

Workers of this category went to the industrial sections of the educational system and then joined the employment system without going through the intervening training system.

Findings on Individual Curriculum Components Utilized

Table 5-8 summarizes the findings from the rating of the curriculum components. Table 5-9 shows the findings related to each of the four curriculum components. It shows the number of workers who utilized each of the school-learned curriculum components and the number of workers who learned substitutes for unutilized components in the employment system. Note that the percentage of workers utilizing the school-learned specific skills component ranked lowest (35%), while the percentage of those utilizing the school-learned general theory component ranked highest (100%).

Table 5-8

Summary of Data on Workers of (M) Category

No.	School trade	Job	Curriculum Components				Rating	Length of in-employment training
			GS	SS	GT	ST		
1	Metal turning	Metal turner	+	+	+	+	4	-
2	Fitting	Miller	+	-	+	+	3	6
3	Metal turning	Metal turner	+	+	+	+	4	-
4	Fitting	Miller	+	-	+	+	3	6
5	Electricity	Electrician	+	+	+	+	4	-
6	Construction electricity	Auto-electrician	-	-	+	-	1	6
7	Fitting	Metal turner	+	-	+	+	3	8
8	General mechanics	Metal turner	+	-	+	+	3	6
9	Mechanics	Fitter	+	-	+	+	3	6
10	General mechanics	Miller	+	-	+	+	3	6
11	Tailoring	Tailor	+	+	+	+	4	-
12	Mechanics	Mechanic	+	+	+	+	4	-
13	General mechanics	Mechanic	+	+	+	+	4	-
14	Fitting	Auto-mechanic	+	-	+	+	3	6
15	Printing	Book-binding	+	+	+	+	4	-
16	Printing	Machine operator	+	-	+	+	3	6
17	Fitting	Shoemaker	-	-	+	-	1	6
18	Shoemaking	Shoemaker	+	+	+	+	4	-
19	Tailoring	Tailor	+	+	+	+	4	-
20	Tailoring	Tailor	+	+	+	+	4	-
21	Tailoring	Tailor	+	+	+	+	4	-
22	Tailoring	Tailor	+	+	+	+	4	-
23	Carpentry	Carpenter	+	+	+	+	4	-
24	Fitting	Researcher	-	-	+	-	1	12
25	General education	Mechanic	-	-	+	-	1	11^{o}
26	Metal turning	Metal turner	+	+	+	+	4	-
27	Fitting	Power operator	-	-	+	-	1	12^{o}
28	Fitting	Miller	+	-	+	+	3	4
29	Mechanics	Auto-electrician	-	-	+	-	1	12
30	General mechanics	Platform operator	-	-	+	-	1	6
31	Metal turning	Electrician	-	-	+	-	1	18
32	Fitting	Clerk	-	-	+	-	1	1
33	Electricity	Locomotive driver	-	-	+	-	1	6^{o}
34	Electricity	Locomotive driver	-	-	+	-	1	6^{o}
35	Mechanics	Printing worker	+	-	+	-	2	6^{o}
36	Electricity	Locomotive electrician	+	-	+	+	3	6^{o}
37	Fitting	Fitter	+	+	+	+	4	-
38	Metal turning	Metal turner	+	+	+	+	4	-
39	Metal turning	Welder	+	-	+	+	3	2
40	Carpentry	Storekeeper	-	-	+	-	1	6
41	General education	Auto-electrician	-	-	+	-	1	12
42	Printing	Printing Worker	+	+	+	+	4	-
43	Mechanics	Auto-electrician	-	-	+	-	1	12
44	Tailoring	Telegraph operator	-	-	+	-	1	1
45	Printing	Printing worker	+	+	+	+	4	-
46	Fitter	Offset mechanics	+	-	+	+	3	8
47	General education	Foreman	-	-	+	-	1	trained abroad
48	Metal turner	Printing worker	-	-	+	-	1	12
49	Tailoring	Tailor	+	+	+	+	4	-
50	General education	Telegraph operator	-	-	+	-	1	1
51	Electricity	Telephone repairman	+	-	+	-	2	12
52	Electricity	Telephone repairman	+	-	+	-	2	12
53	Electricity	Power controller	+	-	+	-	2	11^{o}
54	Metal turning	Power controller	+	-	+	-	2	11^{o}
55	Electricity	Power controller	-	-	+	-	1	11^{o}
56	Fitting	Locomotive mechanic	+	-	+	-	2	10^{o}
57	Fitting	Locomotive mechanic	+	-	+	-	2	10^{o}
58	Electricity	Locomotive electrician	+	-	+	+	3	5^{o}
59	Mechanics	Mechanic	+	+	+	+	4	-
60	Electricity	Locomotive electrician	+	-	+	+	3	5^{o}
61	General education	Foreman	-	-	+	-	1	trained abroad
62	Printing	Printing worker	+	+	+	+	4	-
63	Printing	Printing worker	+	+	+	+	4	-

Source: Field interviews with workers

^{o} = Training in the employing establishment center

Table 5-9

Utilization of Individual Curriculum Components by (M) Category Workers

Curriculum Component	Learned in the Educational system		Learned in the Employment system	
	Number	%	Number	%
Specific skills	22	35	41	65
Specific theory	36	57	27	43
General skills	48	76	15	24
General theory	63	100	0	0

Source: Field interviews with workers as summarized in Table 5-8.

Findings on Groups of Curriculum Components

The data disclosed certain uniform characteristics. All workers were utilizing at least one of the curriculum components. In all cases the general theory component was utilized. When the data were coded, four categories of utilization of groups of components became apparent:

1. General theory component only,
2. General theory component plus one other component,
3. General theory component plus two other components,
4. General theory component plus three other components.

Further study of the data revealed the nature of each of the categories. As has been shown, the category with only one positive sign (defined in the preceding section as UR, Unrelated) always contains the general theory component. The category with two positive signs (defined as BR, Broadly Related), contains the general theory and the general skills components. The category with three positive signs (also defined as BR, Broadly Related), contains the general theory, the general skills, and the specific theory components. The category with four positive signs (defined as CR, Closely Related), contains all four components. In other words, only the workers of the closely related category were utilizing the specific skills component.

The analysis of the rating data produced a cumulative scale in which the utilization of a component in the scale necessarily means that the worker is using all the components below it in the scale (see diagram of scale below). The general theory component has the highest frequency of use, and in descending order of frequency come the general skills, the specific theory, and the specific skills' components.

Diagrammatic Representation of the Scale

	C R	B R	B R	U R
	S S	- -	- -	- -
	S T	S T	- -	- -
	G S	G S	G S	- -
	G T	G T	G T	G T
Rating	4 +	3 +	2 +	1 +

The analysis of the data in terms of groups of curriculum components helps to determine the roles that are played by the school and the employing establishments in the training of the workers. For the workers who are utilizing all four school curriculum components, the employment system either played no essential training role or only a supplementary, upgrading one. For the workers who are utilizing three, two, or one of the school curriculum components, the employment system supplied substitutes for the unutilized one(s) (see diagram below).

Components Supplied by the Employing Establishments in Training

	C R	B R	B R	U R
	- -	S S	S S	S S
	- -	- -	S T	S T
	- -	- -	- -	G S
	- -	- -	- -	- -
Rating		1 +	2 +	3 +

Table 5-10 shows the number of workers utilizing each of the four groups of (school-learned) curriculum components and the number of those who learned substitute components in the employing establishments.

Table 5-10

Utilization of Groups of Components
By Workers of Category (M)

School Components Utilized	Workers Utilizing		Components Learned in Employment	Workers Learning	
	Number	%		Number	%
First Group					
1 - specific skills 2 - specific theory 3 - general skills 4 - general theory	22	35		-	-
Second Group					
2 - specific theory 3 - general skills 4 - general theory	16	25	1 - specific skills	16	25
Third Group					
3 - general skills 4 - general theory	10	16	1 - specific skills 2 - specific theory	10	16
Fourth Group					
4 - general theory	15	24	1 - specific skills 2 - specific theory 3 - general skills	15	24
Total	63	100		41	65

Source: Field interviews with workers, as summarized in Table 5-8.

The role of the general theory component is significant. It is the component utilized by all four categories of workers. For those who found that only one, two, or three components were useful in the employing establishment, the general theory component was helpful in learning substitutes for the unutilized school components. Even for those who found all four school curriculum components useful, the general theory component was useful to them in upgrading their skills. The general skills component was second to the general theory component in helping the worker acquire the missing components, especially the specific skills.

WORKERS WITH MORE THAN FIVE YEARS OF SECONDARY EDUCATION: CATEGORY (S)

The number of the (S) category workers interviewed is 33. All of them joined the employment system after their secondary education and without going through the intervening training system. The interviewed workers have two types of secondary education. One is the industrial education background; that is, the student gets training in specific skills in the industrial option of the technical section of the secondary school. The other is the general education background emphasizing science and mathematics. In the second type are students of the technical mathematics option of the technical section and the general section with its science and mathematics options.

An important difference between the students from the industiral and general sections is the amount of workshop training that each has had. In the industrial option, the student gets a total of 66 units (hours per week) of workshop training in the six secondary education years. In the technical-mathematics option he gets 35 units and in the general section, science specialization, 9 units (see Table 5-11).

Table 5-11

Units of Workshop Training in the Six Secondary Years for the Industrial, Technical-Mathematics and General Options

Category	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Sixth Year	Total Units
Industrial	3	7	8	14	16	18	66
Technical-Mathematics	3	7	8	7	6	4	35
General	3	2	2	1	1	-	9

Source: Statistical Records of the Ministry of Education.

Table 5-12

Summary of Findings on Workers of the (S) Category
with Industrial Education Background

No.	Secondary school years	Educational background	Job	Components				Rating	Length of in-employment training in months
				GS	SS	GT	ST		
64	6	General mechanics	Industrial design	+	-	+	+	3	3
65	6	General mechanics	Integration section	+	-	+	-	2	4
66	6	General mechanics	Production foreman	+	+	+	+	4	-
67	7	Mechanics	Research section	+	+	+	+	4	9
68	5	Mechanics	Telegraph	-	-	+	-	1	6
69	5	Electricity	Power control	+	-	+	-	2	3
70	6	Electro-technique	Instructor - railways	+	-	+	+	3	7
71	5	Mechanics	General foreman	+	+	+	+	4	6
72	6	Electro-technique	Instructor - railways	+	-	+	+	3	7
73	5	General mechanics	Instructor	+	+	+	+	4	5
74	7	General mechanics	Industrial design	+	-	+	+	3	2
75	6	General mechanics	Aircraft mechanics	+	-	+	-	2	9
76	5	General mechanics	Aircraft mechanics	+	-	+	+	3	9
77	6	General mechanics	Aircraft mechanics	+	-	+	+	3	9
78	5	Mechanics	Foundry	+	-	+	-	2	2
79	5	Mechanics	Industrial design	+	-	+	+	3	2

Source: Field interviews with workers.

The number of workers with industrial background is 16 and those with general (technical-mathematics, science, and mathematics) is 17. Workers of both types, the industrial and the general, were found to be work-companions, some of them doing the same type of job, others doing related jobs.

Workers with Industrial Education Background

All 16 workers of the (S) category are employed in public sector establishments. It may be generalized that in Tunisia the higher the level of educational attainment, the greater the student's inclination to seek employment in the public sector. The researcher did not find workers with higher secondary education in the private sector establishments selected for the research.

The findings for the (S) category in Tables 5-12 and 5-13 are similar to those for the workers of the (M) category (see Table 5-9). The percentage of workers utilizing the school-learned specific skills component ranked lowest (only 25%), while the percentage of those utilizing the school-learned general theory component ranked highest (100%). Also, the findings concerning groups of curriculum components are similar to those of the (M) category workers. That is, the analysis of the data again produced a cumulative scale. Again, the general theory component has the highest frequency of use, and in descending order of frequency come the general skills, the specific theory, and the specific skills components. (See Tables 5-13 and 5-14.)

Table 5-13

Utilization of Individual Curriculum Components
by (S) Category Workers

Curriculum Component	Learned in the Educational System		Learned in the Employment System	
	Number	%	Number	%
Specific skills	4	25	12	75
Specific theory	11	70	5	30
General skills	15	93	1	7
General theory	16	100	0	0

Source: Interviews with workers as summarized in Table 5-12.

Table 5-14

Utilization of Groups of Components by Industrial Workers of (S) Category

School Components Utilized	Workers Utilizing		Components Learned in Employment	Workers Learning	
	Number	%		Number	%
First Group	4	25			
1 - Specific skills 2 - Specific theory 3 - General skills 4 - General theory					
Second Group	7	44.5		7	44.5
2 - Specific theory 3 - General skills 4 - General theory			1 - Specific skills		
Third Group	4	24.5		4	24.5
3 - General skills 4 - General theory			1 - Specific skills 2 - Specific theory		
Fourth Group	1	6		1	6
4 - General theory			1 - Specific skills 2 - Specific theory 3 - General skills		
Total	16	100.0		12	75

Source: Interviews with workers as summarized in Table 5-12.

The data show that 12 workers subsituted a new in-employment learned component for the unutilized school-learned specific skills component. Some of them got the specific skills in a formal training center located in the employing establishment, while others got them in less formal on-the-job training. Three workers went abroad to learn their new trades.

Thus, it can be seen that the educational system may not be able to prepare students even with full industrial secondary education for their specific future jobs. The employment system takes the products of the industrial sections of the schools and retrains them according to current needs. The net result is a waste of much of what was learned of specific skills in the educational system.

The Workers of General Education Background, (S) Category.

The remaining 17 workers of the (S) category have general education background. All of them are either work-companions of the industrial option workers or are performing related jobs. Their specific job-related skills were acquired in the employment system in Tunisia or abroad. If the training was in Tunisia, the training center of the employing establishment was the training agent. The case histories of these students provide evidence of unduplicated training, in which the educational system provides the general theory and general skills components and the employment system provides the necessary job related specific skills and the specifically related theory (Table 5-15).

WORKERS OF THE UPGRADING TRAINING CENTERS: CATEGORY (P)

An upgraded worker is defined as one who acquired specific skills in a field of specialization or trade in the educational system, upgraded these skills in an upgrading center of the employment system or the intervening training system, and when employed used these upgraded skills.

Forty-one workers who had been to upgrading centers were randomly chosen from the selected establishments and interviewed. They were found to be employed in twelve establishments, the majority of which are in the public sector. Results of the interviews suggest several variations within the above definition of an upgraded worker.

Table 5-15

Summary of Findings on Workers of the (S) Category, with General Education Background

No.	Secondary school years	Educational background	Job	Length of in-employment training in months
80	5	Modern literature	Foreman	18
81	5	Technical mathematics	Programing officer	8
82	5	Technical mathematics	Telecommunication officer	9
83	6	Science	Foreman	12
84	7[o]	Science	Assistant foreman	12
85	5	Mathematics	Aircraft mechanic	12
86	6	Technical mathematics	Aircraft mechanic	12
87	5	Mathematics	Meteorologist	12
88	6	Technical mathematics	Aircraft mechanic	12
89	7[o]	Mathematics	Telecommunication officer	9
90	5	Technical mathematics	Telecommunication officer	9
91	5	Science	Meteorologist	12
92	5	Mathematics	Meteorologist	12
93	6	Technical mathematics	Deck officer	12
94	6	Technical mathematics	Mechanic	12
95	5	Science	Deck officer	12
96	5	Science	Deck officer	12

Source: Field interviews with employed workers

[o] = Workers with seven years of secondary education according to the old system.

Workers With No Duplicated Training

Workers with no duplicated training are the products of the educational system and an upgrading center of the intervening training system or of the employment system. An example of this category is the worker who studied auto-mechanics in the college moyen for three years, upgraded his skills in an upgrading center for one year to become a diesel specialist, and is currently working as a diesel specialist in an employing establishment (see diagram 5-1). Only nine of the 41 upgraded workers, or 22%, fit this pattern of the unduplicated upgraded training (see Table 5-16).

Diagram 5-1

Unduplicated Training of Workers of (P) Category

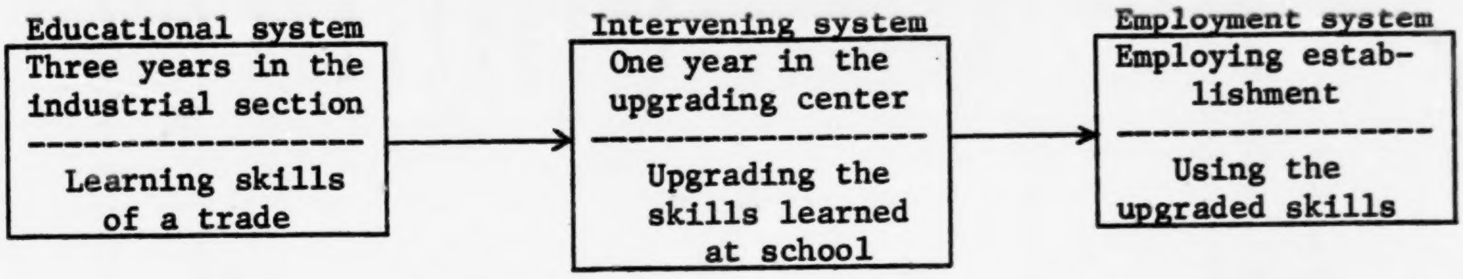

Educational system
Three years in the industrial section
Learning skills of a trade
Intervening system
One year in the upgrading center
Upgrading the skills learned at school
Employment system
Employing establishment
Using the upgraded skills

Table 5-16

Workers with no Duplicated Training, Product of the School and Center

No.	Educational system background (trade)	Upgrading Background	Current Job
97	Auto-mechanics	Diesel mechanic	Diesel mechanic
98	Electricity	Electro-mechanic	Electro-mechanic
99	Metal turning	Rectification	Rectification
100	Auto-mechanics	Diesel mechanic	Diesel mechanic
101	General mechanics	Metal turner	Metal turner
102	Technical mathematics	Gas network operator	Gas network operator
103	Technical mathematics	Gas network operator	Gas network operator
104	General mechanics	Auto-mechanic	Auto-mechanic
105	General mechanics	Auto-mechanic	Auto-mechanic

Source: Interviews with employed workers.

Workers with Duplicated Training

The remaining 32 of the 41 workers of the (P) category (78%) do not fit the definition of unduplicated training. These workers were found to represent various types of training arrangements in which the worker learned new job-related skills either in the intervening training system or in the employment system. The researcher found four patterns of retraining in the school-learned skills or in new skills.

1. Five workers (12% of the 41 workers) learned a set of specific skills in the educational system and then either relearned the same set of specific skills or learned new skills in the intervening training system (Table 5-17). When these workers came to the employment system, they learned still another set of specific skills which they are currently using in performing their jobs. An example is the worker who learned to be a fitter at school, then learned to be an auto-electricity repairman in an upgrading training center, and currently is working as a power generator controller, a job he learned in the employing establishment's training center (see diagram 5-2).

Diagram 5-2

Learning a Trade in Each of the Three Systems

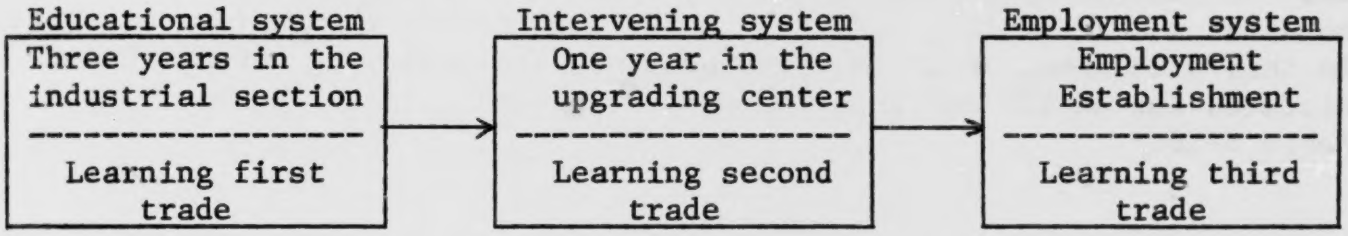


Table 5-17

Workers with Duplicated Training in the Three Systems

No.	Educational system Background (trade)	Upgrading background (A second trade)	Current job (A third trade)
106	Fitting	Metal turner	Laboratory technician
107	Mechanics	Fitter	Clerk
108	Fitting	Auto-electricity repair man	Power generator controller
109	Mechanics	Electro-mechanic	Power generator controller
110	Fitting	Gas network technician	Laboratory technician

2. For 11 workers (27% of the 41), the new departure in training was not between the school and the upgrading center but between these two and the employing establishment. An example of this is the worker who learned general mechanics at school, upgraded his skills as a diesel motorist in the center, and then became a fitter in the employment system. In this situation, as in the previous one, the employing establishment dictated the skills and imparted what it needed. (See Diagram 5-3 and Table 5-18.)

Diagram 5-3

Upgraded Skills of the School and Center Training Being Replaced by New Job-related Skills

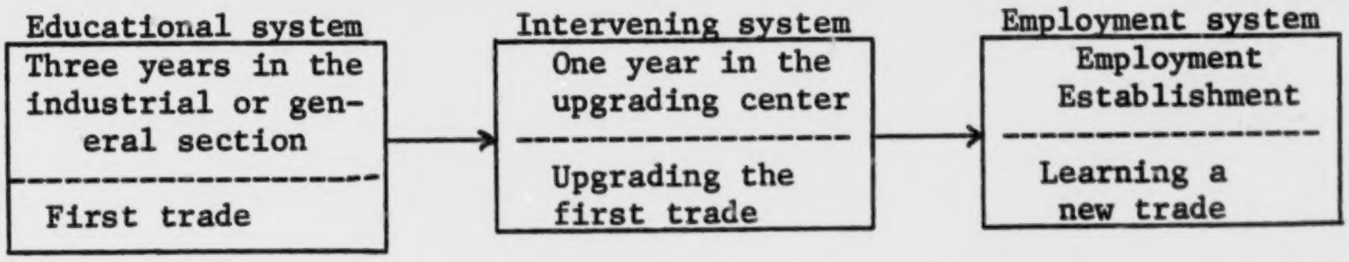


Table 5-18

Workers with Congruent Training in School and Center, then Non-Congruent Training in Employment

No.	Educational system Background	Upgrading Background	Current job
111	General electricity	Electro-mechanics	Industrial electrician
112	General mechanics	Diesel mechanics	Miller
113	Metal turning	Rectification	Welder
114	General mechanics	Fitting	Metal turner
115	Technical mathematics	Gas network	Laboratory technician
116	General Education	Mechanics	Auto-mechanic
117	General Education	Mechanics	Metal turner
118	General Education	Electro-technique	Power generator controller
119	Electricity	Electrical network	Statistician
120	Technical mathematics	Welding	Diesel mechanic
121	General mechanics	Diesel	Deck officer

Source: Interviews with employed workers.

3. Ten workers who have had trade training in school were found to be receiving upgrading training in the employing establishments' centers (Table 5-19). The researcher visited the Railways Company Upgrading Center and the Cement Factory Upgrading Center and interviewed several of the trainees. It was difficult to draw a line between upgrading and basic training. The researcher is of the opinion that the training is a basic accelerated type rather than upgrading. Thus, in these cases the employment system is duplicating the training provided in the educational system. (See Diagram 5-4 and Table 5-19.)

Diagram 5-4

Non-Congruent Training in the School and the Centers of the Employment System

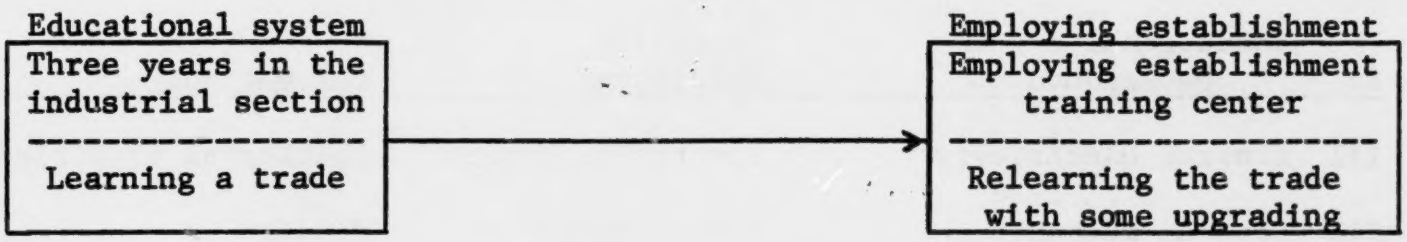

Educational system
Three years in the industrial section
Learning a trade
Employing establishment
Employing establishment training center
Relearning the trade with some upgrading

Table 5-19

Non-Congruent Training in the School and the Centers of the Employment System

No.	Educational system (trade)	Relearning in Employment
122	Fitting	Fitting
123	Technical mathematics	General mechanics
124	General mechanics	General mechanics
125	Metal turner	General mechanics
126	Fitting	General mechanics
127	General mechanics	Miller
128	General mechanics	Fitting
129	General mechanics	Metal turner
130	Fitting	Fitting
131	General mechanics	Miller

Source: Interviews with employed workers.

4. Six workers are utilizing in the employment system trades which were learned in the upgrading center and not the trades which were learned in the school. (See Diagram 5-5 and Table 5-20.)

Diagram 5-5

Trade Learned in the Center and Not in the School Being Used in the Employing Establishment

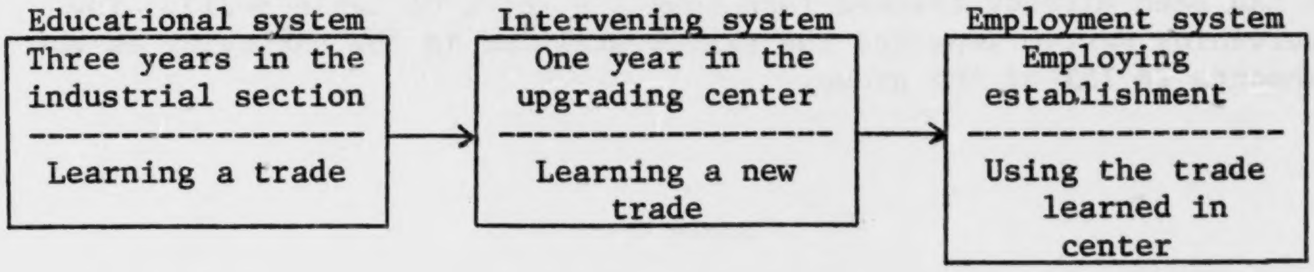


Table 5-20

Trade Learned in the Center and Not in the School Being Used in the Employing Establishment

No.	Educational system Background	Upgrading Background	Current job
132	Fitting	Milling	Milling
133	Fitting	Metal turning	Metal turning
134	Auto-mechanics	Auto-electricity	Auto-electricity
135	Welding	Metal turning	Metal turning
136	Fitting	Auto-electricity	Auto-electricity
137	Mason	Network electricity	Network electricity

Source: Interviews with workers.

Summary of Findings on Workers of the (P) Category.

The findings of this section on the (P) category of interviewed workers -- those who have had training in upgrading centers — suggest that the employment system is in fact acting as the training agent to impart the skills needed by the establishments. The educational system cannot predict actual needs of the employing establishments (see Table 5-21). Only 22% of the interviewed workers of the (P) category utilized the (school-learned) specific skills in the current jobs. The employment system imparted the needed skills for 63% of the 41 workers who had been already trained (see rows 2 a, b, c of Table 5-21). The intervening system imparted the skills utilized in the employing establishments to 15% of the group.

Table 5-21

Summary of Findings on the (P) Category

Category	Number	%
1 - Workers with unduplicated training	9	22
2 - Workers with duplicated training		
a) A trade learned in each of the three systems	5	11.6
b) School trade upgraded in center, then a new trade learned in establishment	11	27
c) A trade learned in school, then a second trade learned in establishment	10	24.4
d) A trade learned in school, a second trade learned in center; trade of center utilized	6	15
Total	41	100.0

Source: Interviews with workers.

WORKERS OF THE ACCELERATED TRAINING CENTERS: CATEGORY (F)

Only 16 workers with accelerated training backgrounds were interviewed. Not many of this category were found in the employing establishments selected for the research. The educational background of such workers is discussed on page 3-11. The field survey of employed workers reveals that a worker from the accelerated centers has one of the following three educational backgrounds (see Table 5-22):

1. Full elementary education
2. Some secondary general education
3. Some secondary industrial education

This variation in educational background of the trainees raises an important question. If elementary school graduates are trainable in the accelerated centers, then is anything above that a waste? Or, can it be argued that any additional general education beyond the elementary level makes the trainee more trainable?

Duplication of Training

There is no duplication of training in the case of elementary school leavers or persons from the general sections of the college moyen or secondary school drop-outs. The training these received in the accelerated center was completely new. However, there is duplication in the case of the drop-outs from the industrial sections. Their training in the industrial sections did not give them any apparent advantage over the trainees who had no specific skills when they arrived. That is, all received the same kind of training in the center.

As for duplication between the center and the employment system, all but three of the 16 workers interviewed are doing jobs for which they were trained in the center. These three learned their new trades in the employing establishment. The congruence between center training and present jobs for this group may be explained as follows. Some of the trainees (7 of the 13) had worked for a period of time in small workshops after dropping out of school and before joining the training center. The accelerated training of the center was in a sense a perfection of skills they already had gotten from the small workshops. When they finished the training, they tried to find jobs which met their pre-center work-experiences and center training and succeeded in doing so.

Table 5-22

Summary of Findings on the (F) Category Workers

No.	Educational background	Pre-center experience	Accelerated center trade	Job
138	Elementary	Workshop	Mechanics	Mechanic
139	Elementary	Workshop	Auto-body repair	Auto-body repairman
140	Two years secondary general		Auto-body repair	Auto-body repairman
141	Three years secondary general	Workshop	Auto-body repair	Auto-body repairman
142	Three years secondary industrial		Auto-body repair	Auto-body repairman
143	Elementary		Mechanics	Mechanic
144	Two years secondary general		Auto-body repair	Auto-body repairman
145	Three years secondary general		Mechanics	Welder
146	Three years secondary commercial	Workshop	Mechanics	Mechanic
147	Elementary		Auto-body repair	Mechanic
148	Three years tailoring		Tailoring	Foreman tailoring factory
149	Three years secondary general	Workshop	Auto-mechanics	Auto-mechanic
150	Three years secondary industrial		Monotype operator	Monotype operator
151	Three years secondary general	Printing	Monotype operator	Monotype operator
152	One year secondary general		Mechanics	Linotype operator
153	Three years secondary industrial	Hotelier	Hotelier	Bookbinding

Source: Field interviews with employed workers

No final conclusions or generalizations can be stated because of the small number of interviewed workers in this category. However, the small number of interviewees is an indication of the small size of the total number of this category employed in the selected establishments in the three industrial areas studied.

WORKERS WITH ELEMENTARY EDUCATION, CATEGORIES (A), (PA), and (I)

(A) refers to the worker who finished his elementary education and got his training through apprenticeship in the employment system. Workers with less than the full elementary education are grouped in the (I) category. (PA) refers to the worker who finished the full elementary education and spent one year in the preapprenticeship center before joining the employment system as an apprentice. The (A) and the (I) workers are the products of the educational and the employment systems. The (PA) worker is the product of the three systems, the educational, the intervening, and the employment. Each system complemented the other one or two systems in the education-training functions. The number of interviewed workers of the (PA) category is 29, of the (A) 44, and of the (I) 17.

Is there any difference between the (A) and the (PA) workers in the actual apprenticeship situation? Is the (PA) apprentice more capable than the (A) apprentice in the in-employment training process and in actual work situations? In other words, what are the effects of spending one year in the preapprenticeship centers? The Psycho-technical Selection Center of the Office of Training and Employment conducted a study of two samples of already employed (A)s and (PA)s. The following findings were arrived at [1967:21]:

1. The (PA) is significantly superior to the (A) in practical intelligence and spatial visualization, but not in general intelligence or in recognition of tools.

2. The (PA) is significantly superior in French but not in mathematics.

3. The (PA) does not demonstrate a superiority in manual dexterity.

4. There is no difference between the (A) and the (PA) in wages.

The researchers caution that it is difficult to generalize from the conclusions [22]. They state that there are variations between regions and establishments. They also state that whatever superiority the (PA) has is a matter of initial facilitation rather than a durable characteristic.

Interviewed apprentices of the (A) and the (PA) categories were found in three types of establishments:

1. Big factories in which there is mass production and modern machinery.
2. Big workshops in which the skills used are specialized.
3. Small workshops.

Interviews with the 29 (PA) and 44 (A) workers revealed that apprenticeship in big factories is shorter than that in the specialized big workshops or the small workshops. Therefore, the three-year minimum apprenticeship which all apprentices must undergo is in fact an apprenticeship with respect to earnings, but not production. Many apprentices stated that they actually finished their apprenticeship in one-third of the required period, yet they continued to earn the nominal wage usually paid to apprentices.

SUMMARY OF FINDINGS OF THE INTERVIEWS WITH 243 WORKERS

The following table gives a summary of the central finding of the interviews with the 243 workers selected from three industrial areas in Tunisia:

Table 5-23

The Role of the Employment System in Providing Job-related Skills for the 243 Interviewed Workers

Category	Number Interviewed	Number of the interviewed acquiring job-related skills in the employing establishment	%
Category (M)	63	41	65.0
Category (S)	33	29	87.9
Category (P)	41	26	63.0
Category (F)	16	3	18.6
Category (PA)	29	29	100.0
Category (A)	44	44	100.0
Category (I)	17	17	100.0
Total	243	189	77.7

Source: Interviews with 243 workers.

The educational system, through the industrial sections of the college moyen and the secondary school, supposedly supplies the market with trained, skilled manpower for middle-level occupational positions. However, when the workers in the interviewed sample got employment, they generally learned new job-related specific skills. Employing establishments provided new specific skills for 77.7% of the 243 interviewed workers.

Based on the analysis of utilization of curriculum components, it can be stated that the more specific the training provided by the educational system, the less likely it is to be relevant to the actual job-related skill needs of the employment system. On the other hand, the general theory component of the curriculum was useful to all workers; general skills and specific theory were utilized to an intermediate degree. In other words, the more general and theoretical aspects of the education and training provided by the educational system are most likely to be relevant to the actual job-related needs of the employment system.

CHAPTER 6

BENEFIT/COST ANALYSIS

The present research has demonstrated that there is a considerable amount of duplication of functions and non-complementarity. Duplication of functions has many cost implications. A worker trained in the three systems costs society more than one trained in two systems, and much more than a worker trained in only one system. Yet the three workers might be doing the same type of job and have approximately the same earnings. This chapter details the cost of training a student in each of the three systems. This is followed by a benefit/cost analysis of various lines of actions in occupational education and training.

THE PUBLIC EDUCATIONAL SYSTEM

The Ministry of Education in Tunisia spends about 30% of the total national budget. Khoi states that this is the highest such percentage in the world [Khoi:1964:3, see also Waeberghe:1964:32]. Al-Kusi gives comparative figures for the share of education in national budgets for some of the Arab countries (Table 6-1). Tunisia's share for education in its national budget is about four times that of Jordan, 3.5 times that of the UAR, twice that of Morocco, Syria, and Lebanon, and also exceeds that of Libya and Iraq [Al-Kusi:1966:58].

Table 6-1

The Educational Budget in Per Cent
Of the Total National Budget

Year	Lebanon	Libya	Iraq	Syria	Morocco	UAR	Jordan	Tunisia
1957/58	11.7	17.8	20.3	14.3	13.3	16.5	7.1	16.8
1958/59	13.3	17.0	19.4	13.9	14.0	11.7	8.3	18.0
1959/60	11.8	20.2	18.4	14.5	15.5	14.4	7.0	18.7
1960/61	13.5	21.0	20.9	13.8	16.5	19.2	7.7	19.4
1961/62	10.2	21.7	21.4	14.4	18.2	18.1	8.7	21.4
1962/63	13.2	24.5	23.4	14.9	16.4	13.1	8.3	22.8
1963/64	13.3	21.0	25.0	----	----	10.2	8.1	31.4
1964/65	13.2	20.3	24.4	----	----	9.6	---	----

Source: A Survey of Educational Progress in the Arab States 1960-65, by A. A. Kusi.

Khoi estimates that Tunisia's educational budget for the year 1962 accounts for 6% of the gross national product [Khoi:1964:1]. This percentage is also one of the highest in the world. Al-Kusi gives estimates for 16 countries. Among them only Finland ranks higher than Tunisia. (Table 6-2) [Al-Kusi:1966:57.]

Table 6-2

Expenditure on Education as Percentage
Of National Income For Some Countries

Country	Per Cent	Country	Per Cent
Morocco	4.3	Mexico	1.9
Tunisia	6.0	Finland	6.6
Sudan	1.5	Sweden	5.4
UAR	5.9	U.K.	4.8
Pakistan	1.0	Spain	1.6
India	2.4	Portugal	2.2
Cuba	4.6	Italy	4.0
Jordan	3.0	Japan	5.5

Source: A survey of Educational Progress in The Arab World 1960-65, by A. A. Kusi.

One note on the figures of Tables 6-1 and 6-2: A high share of the national budget or the national income for education does not guarantee a highly productive educational system. One measure of productivity is the percentage of first grade students who finish the twelfth grade with diplomas. For example, Jordan spent 7% of its national budget on education in 1965/66 and 14% of the first grade students finished the twelfth grade with diplomas, while Tunisia spent 30% of its national budget on education in 1965/66 and only 2% of the first grade students finished the twelfth grade with diplomas. Jong argues that the high rate of drop-outs and repeaters at the elementary level in Tunisia accounts for a waste of one quarter of the educational budget, or 6% of the national budget [Jong:1966:23].

The high rate of educational expenditure in Tunisia should also be viewed in the light of costs per student, which appear to be high when compared with other countries. Costs will be explored in this chapter, and some comparisons with Jordan will be made.

Public Capital Costs in the Second Cycle of Education

The second cycle includes the college moyen schools and the secondary schools. "Industrial sections" will be used to refer to the industrial sections of the college moyen and the industrial options of the technical sections of the secondary school. Practically every school in the second cycle of education contains a general section, an industrial section, and a boarding section which accommodates about 40% of the enrolled students. The presence of workshops and boarding sections makes the calculations of costs somewhat difficult. The simplest approach would be to calculate the average cost per student without distinguishing between boarders and day students or between students in the industrial section and the general section. However, this method does not serve the purpose of analyzing the costs of alternative means of providing occupational education and training.

Therefore, a breakdown of costs is attempted in order to arrive at the per pupil-place cost for these four categories:

1. Industrial section
    a) Boarder student.
    b) Day student.

2. General section
    a) Boarder student
    b) Day student.

1. Building construction.* Ministry of Education data give the global figure of 190 TDs as the per pupil-place cost for building construction, thus making the cost for a school of 1,400 students 264,000 TDs. This figure does not differentiate between the industrial and general students. Solomon indicates that the cost per pupil-place of capital investment on construction for the industrial section is 1.75 times that of the general section [Solomon:160: The ratios attributed to Solomon are calculated from figures used at the Conference on Education and Economic and Social Development in Latin America, March 1962]. Of the 1,400 students, 400 are in the industrial section. Using these figures, the per pupil-place cost in the general section is 157 [264,000 = X (1,000 + 1.75 x 400)], and the per pupil-place cost in the industrial section is 274 TDs (157 x 1.75).

2. Equipment. Ministry of Education data give the global figure of 117 TDs as the per pupil-place cost for equipment and furniture, thus making the cost for a school of 1,400 students 163,800 TDs. This figure does not differentiate between the general and industrial sections. Solomon indicates that the per-pupil cost of equipment in the industrial section is three times that of the general section (162). Since 400 of the 1,400 students are in the industrial section, the cost per pupil-place in the general section is 74 TDs [163,800 = X (1,000 + 3 x 400)] and the industrial section 222 TDs.

3. Construction for the boarding section. Ministry of Education data give the figure 325 TDs as the cost per pupil-place in the boarding section. This figure applies for both the industrial and general students.

This breakdown of costs provides the necessary data for arriving at the public capital costs per pupil-place according to the four categories of students (see Table 6-3).

Table 6-3

Per Pupil-Place Public Capital Costs According To Four Categories of Students in TDs.

Category	Building Construction	Equipment Furniture	Boarding Construction	Total
Boarder industrial	274	222	325	821
Day industrial	274	222	-	496
Boarder general	157	74	325	556
Day general	157	74	-	231

---

*Building construction refers to all school buildings except the boarding sections.

Public Current Expenditure

Khoi estimates the current per pupil costs for the college moyen at 81.0 TDs and for the secondary school as 112.0 TDs [Khoi:12]. These estimates lack two major cost breakdowns. There is no distinction between the per pupil cost in the industrial and the general sections, and there is no distinction between the per pupil cost in terms of boarding and day arrangements.

Solomon indicates that the current cost of the student in the industrial section is twice that of the general section [p:161]. The budget for secondary education is 6,100,000 TDs. The number of secondary students is 70,000, of whom 14,000 are in the industrial sections. The current per pupil cost in the general section is 72 TDs; that of the industrial section is 144 TDs [6,100,000 = X (56,000 + 2 x 14,000)].

These two figures for current per pupil cost are for the day students. According to principals interviewed, a boarding student costs about 60 TDs, of which 65% comes from public sources but is not included in the national educational budget. In this research the 60 TDs are assumed to be public costs. Table 6-4 shows the per pupil cost of current expenditure for the four categories of students.

Table 6-4

Per Pupil Cost of Current Expenditure
For the Four Categories of Students, in TDs

Category	Per Pupil Cost
Boarder industrial student	204
Day industrial student	144
Boarder general student	132
Day general student	72

Private Costs

Private costs comprise two items. The first is out-of-pocket expenses. This is what the student pays for goods and services required for or incidental to his education and not provided by the school. From interviews with principals and students, it is estimated that a student spends six dinars annually for such expenses.

The second private cost is opportunity costs. These are the indirect private costs. The student who finishes the sixth grade and chooses to continue his education foregoes the income which he could have earned had he chosen to terminate his education and become employed -- assuming, of course, that he found work. Calculations of costs in the three years of the college moyen and the six years of the secondary school are made with and without opportunity cost [see Schultz:1961:1-7, 1963:23]. Results of interviews with the elementary school graduates employed showed that a person with six years of education earns about 10 TDs per month as a second or third year wage. Therefore, 120 TDs is taken as the annual opportunity cost of the industrial and general sections.

Annual Public and Private Per Pupil Costs

The researcher used the standard method of calculating the annual costs of capital outlays [Blitz:1962:147]. These costs include: (1) depreciation for building and equipment, (2) interest on capital, which includes values of land, building, and equipment, (3) property tax exemption. The interest rate used is 5%. The rate of depreciation for buildings is 2% and for equipment 10%. The value of annual property tax exemption is 20% of the annual renting of buildings. The per pupil-place cost figures given in Table 6-3 are accordingly changed into annual public per pupil cost.

The annual per pupil public current expenditure (Table 6-4) and the annual private direct and indirect costs are added to get the full annual per pupil cost (see Table 6-5).

Table 6-5

Annual Per Pupil Cost, Public and Private, For The Four Categories of Students, in TDs

Category	Boarder Industrial	Day Industrial	Boarder General	Day General
Public capital investment	87.21	57.96	54.48	25.23
Public current expenditure	204.00	144.00	132.00	72.00
Private direct cost	6.00	6.00	6.00	6.00
Sub-total	297.21	207.96	192.48	103.23
Private indirect cost	120.00	120.00	120.00	120.00
Total	417.21	327.96	312.48	223.23

Present Value of Per Pupil Cost in Three Years for the College Moyen and Six Years for the Secondary School

The calculation of the present value of the per pupil public and private costs is based on the following formula [see Leff:111]:

$$Q = \sum_{t=1}^{3} (C_t + Y_t)(1 + i)^{-t+1} \qquad \text{for the \underline{college moyen}}$$

$$Q = \sum_{t=1}^{6} (C_t + Y_t)(1 + i)^{-t+1} \qquad \text{for the secondary school}$$

Where Q = the present value of the per pupil cost in the three years in the college moyen, or six years in the secondary school; C = the annual public or private direct costs per pupil; i = the rate used to discount to present value the future costs; t = the number of years, the first year of schooling in the college moyen or in the secondary school counted as year 1.

Table 6-6 gives the calculated present value of per pupil cost for three years (college moyen) with and without opportunity cost.

Table 6-6

Present Value of the Per Pupil Cost in Three Years
For the Four Categories of Students, in TDs

Category	With opportunity cost	Without opportunity cost
Boarder industrial	1182	840
Day industrial	935	593
Boarder general	891	549
Day general	637	295

Table 6-7 gives the present value of per pupil cost for six years (secondary school) with and without opportunity cost.

Table 6-7

Present Value of the Per Pupil Cost in Six Years
For the Four Categories of Students, in TDs

Category	With opportunity cost	Without opportunity cost
Boarder industrial	2212	1575
Day industrial	1742	1105
Boarder general	1662	1025
Day general	1188	551

THE INTERVENING TRAINING SYSTEM

Discussions and interviews with directors of seven training centers of the Office of Training and Employment revealed the fact that centers have dissimilar costs. There are differentials between the costs of a preapprenticeship center, an accelerated training center, and an upgrading training center. Also, not all centers of each type have the same costs. Furthermore, calculation of the per pupil cost is made difficult by the variation in the number of enrolled trainees from one year to another. Because of this, one center, whose costs represent an average, was selected. Table 6-8 shows the capital investment of the upgrading mechanics center at Ariana.

Table 6-8

Public Capital Costs for the
Mechanics Upgrading Center, in TDs

Category	Costs
Building	205,000
Equipment	200,000
Land	2,600

Source: Center's records and discussion with Mr. Hussein Ben-Hussein, the director.

The mechanics training center usually has an enrollment of 95 students per year. Following the same method discussed on page 89, the public capital costs of Table 6-8 are changed into annual per pupil cost which is 587 TDs. The current expenditure for the year 1965-66 was 30,000 TDs. Thus, the public current per pupil cost is 316 TDs, making the total public per pupil cost (capital and current) 903 TDs. The private direct cost is 6 TDs. The private indirect cost is considered only for the graduate of the college moyen, who usually joins the centers of the intervening system. The average initial earnings of 63 interviewed workers who have the college moyen background is 22 TDs per month, making the annual initial earning 264 TDs, which is income foregone of the student who joins a training center. The per trainee cost, both public and private, is thus estimated at 1173 TDs with opportunity cost and 909 TDs without opportunity cost. The present value, discounted back for four years, is 1013 TDs with opportunity cost, and 785 TDs without opportunity cost.

THE EMPLOYMENT SYSTEM

The Cement Factory Training Center data are taken as the basis for calculating the cost of training in the employment system. Table 6-9 shows the public capital costs.

Table 6-9

Public Capital Costs of the Cement Factory Training Center, in TDs

Category	Cost
Building	10,000
Equipment	19,950
Land	3,000

Source: Factory records, and interview with the director of the training center.

The Cement Training Center usually has an enrollment of thirty trainees per year. Following the same method discussed on page 89, the public capital costs are changed into annual per trainee cost, which is estimated at 158 TDs. The current expenditure for the year 1965/66 was 2057 TDs. Thus, the public current per pupil cost is 68 TDs, making the total public per pupil cost (capital and current) 226 TDs. The private direct cost is 6 TDs, and the opportunity cost is 264 TDs (see page 6-12). The per trainee cost, both public and private, is thus estimated at 496 TDs with opportunity cost and 232 TDs without opportunity cost. The present value, discounted back for four years, is 429 TDs with opportunity cost and 200 TDs without opportunity cost.

COST OF TRAINING IN THE COLLEGE MOYEN

AND THE INTERVENING SYSTEM COMBINED

Industrial Section

The present value of per pupil cost of training during three years in the industrial section of the college moyen (day industrial) and one year in a center of the Office of Training and Employment is 1948 TDs with opportunity costs and 1378 TDs without opportunity cost (see Table 6-10).

Table 6-10

Present Value of Per Pupil Cost of Three Years of Training in Industrial Section and One Year in the Intervening System, in TDs

Category	With opportunity cost	Without opportunity cost
Industrial section	935	593
Center	1013	785
Total	1948	1378

General Section

The present value of per pupil cost of education during three years in the general section (day general) and one year in a center of the Office is 1650 TDs with opportunity cost and 1080 TDs without opportunity cost (see Table 6-11).

Table 6-11

Present Value of Per Pupil Cost of Three Years of Education in the General Section and One Year Training in the Intervening System, in TDs

Category	With opportunity cost	Without opportunity cost
General Section	637	295
Intervening center	1013	785
Total	1650	1080

COST OF TRAINING IN THE COLLEGE MOYEN AND THE EMPLOYMENT SYSTEM COMBINED

Industrial Section

The present value of per pupil cost of training during three years in the industrial section (day industrial) and one year in a center run by an employing establishment is estimated at 1364 TDs with opportunity cost and 793 TDs without opportunity cost (see Table 6-12).

Table 6-12

Present Value of Per Pupil Cost of Three Years of Training in the Industrial Section and One Year in a Center of an Employing Establishment, in TDs

Category	With opportunity cost	Without opportunity cost
Industrial section	935	593
Employing establishment	429	200
Total	1364	793

General Section

The present value of per pupil cost of education in three years in the general section and one year in a center run by an employing establishment is 1066 TDs with opportunity cost and 495 TDs without opportunity cost (see Table 6-13).

Table 6-13

Present Value of Per Pupil Cost of Three Years of Education in the General Section and One Year in a Center of an Employing Establishment, in TDs

Category	With opportunity cost	Without opportunity cost
General section	637	295
Employing establishment	429	200
Total	1066	495

COST OF TRAINING IN THE SECONDARY SCHOOL AND EMPLOYMENT SYSTEM COMBINED

Graduates of the secondary schools, (S category workers), from both the general and industrial sections, were found in the Railways Training Center, the Merchant Navy Training Center, and the Civil Aviation Training Center and not in the Cement Factory Center which was taken as the basis of the college moyen trainees' costs. The data of the Merchant Navy Training Center, which reveal higher costs than the Cement Factory Training Center, are used for calculating the costs of training in the case of the workers with secondary education.

Using the data in Table 6-14, the per pupil public capital and current costs is 620 TDs. The private direct cost is 6 TDs. The average annual earning of a student with secondary education is defined as the foregone income of trainees in the employing establishment training center, which is 420 TDs. The per trainee cost, both public and private, is 1046 TDs with opportunity cost and 626 TDs without opportunity cost. The present value, discounted back for seven years, is 830 TDs with opportunity cost and 490 TDs without opportunity cost.

Table 6-14

Public Capital Costs and Current Annual Expenditure for Merchant Navy Training Center, in TDs

Category	Costs
1. Capital	
Building	200,000
Equipment	20,000
Land	2,000
2. Current	
Current expenditure (1966/67)	25,000

Source: Training Center Records.

Industrial Section

The present value of per pupil cost of training in six years in the industrial section (day industrial) and one year in a center run by an employing establishment is 2572 TDs with opportunity cost and 1595 TDs without opportunity cost (see Table 6-15).

Table 6-15

Present Value of Per Pupil Cost of Six Years of Training in the Industrial Section and One Year in a Center of the Employing Establishment, in TDs

Category	With opportunity cost	Without opportunity cost
Industrial section	1742	1105
Employing establishment	830	490
Total	2572	1595

General Section

The present value of per pupil cost of education in six years in the general section (day general) and one year in a center run by an employing establishments is 2018 TDs with opportunity cost and 1041 TDs without opportunity cost (see Table 6-16).

Table 6-16

Present Value of Per Pupil Cost of Six Years of Education in the General Section and One Year in a Center of Employing Establishment, in TDs

Category	With opportunity cost	Without opportunity cost
General section	1188	551
Employing establishment	830	490
Total	2018	1041

COST PER SUCCESSFUL GRADUATE

The centers run by the Office of Training and Employment and by the employing establishments do not have a significant problem of drop-outs. In fact, the duration of the period of training, which is usually one year, makes the problem negligible.

On the other hand, the educational system, according to official statistical data, suffers a very high rate of drop-outs. Of the 100 students who started their first secondary year in 1961/62, only 22 got their sixth secondary year diploma in 1966/67. The corresponding figure for those who finish the college moyen is 33. Taking these percentages into consideration, the per successful graduate cost of a secondary school graduate is 4.5 times that of the per pupil cost (100/22 = 4.5). The per successful graduate cost of a college moyen graduate is 3.3 times that of the per pupil cost (100/33 = 3.3). Accordingly, the data in Tables 6-6 and 6-7 are converted to per successful graduate figures in the following two tables. Only the data for day industrial students and day general students are used for these calculations.

Table 6-17

Present Value of Per Successful Graduate Cost
of Three Years College Moyen, in TDs

Category	With opportunity cost	Without opportunity cost
Day industrial	3085	1956
Day general	2102	973

Table 6-18

Present Value of Per Successful Graduate Cost
of Six Years Secondary School, in TDs

Cateogry	With opportunity cost	Without opportunity cost
Day industrial	7839	4972
Day general	5108	2369

COMPARISON OF COSTS

Three summary charts are presented. Chart 6-1 represents the cost ratio of training for three years of the graduate of the industrial section to the graduate of the general section plus the cost of training in the centers of the Office of Training and employment. Part (A) of the chart shows the per pupil costs; Part (B) gives the per successful graduate costs.

Chart 6-2 represents the cost ratio of training for three years of the graduate of the industrial section to the graduate of the general section plus the cost of training in the centers of the employing establishments. Part (A) of the chart shows the per pupil costs; Part (B) of the chart shows the per successful graduate costs.

Chart 6-3 represents the cost ratio of training for six years of the graduate of the industrial section to the graduate of the general section plus the cost of training in a center of an employing establishment. Part (A) of the chart gives the per pupil costs; Part (B) of the chart gives the per successful graduate costs.

COMPARISON OF COSTS BETWEEN TUNISIA AND JORDAN

It is evident from the ratios of costs in the industrial sections to costs in the general sections of secondary education in Tunisia that, for the cost of educating and training one student in the industrial sections, the Ministry of Education could educate two students in the general section. Specific training could then be given to these students at the point of employment or in employment, either in the employing establishments or in one of the centers of the intervening training system.

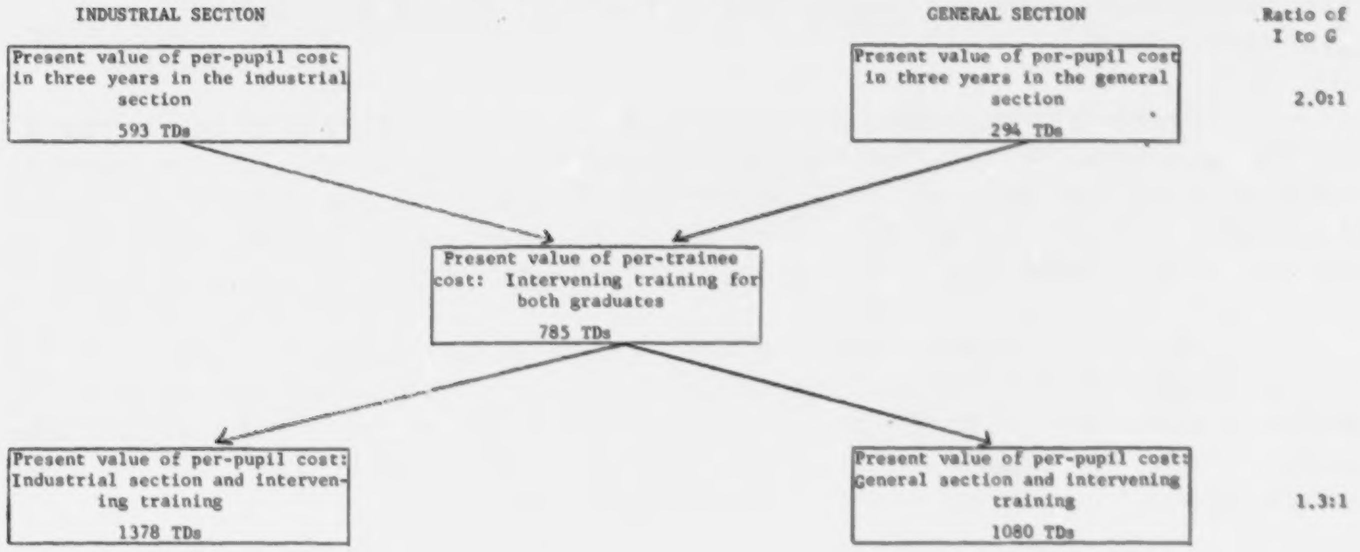
The cost of general education in Tunisia is very expensive as compared, for example, with that of Jordan [see Al-Bukhari:157]. The present value of per successful graduate cost in three years in the secondary general school in Jordan is 195 TDs, while in Tunisia it is 973 TDs (one JD is 1.3 TDs). Thus, figured on a per successful graduate basis, the cost of general education in Tunisia is five times that of Jordan. This high cost in Tunisia may be attributed to three main factors: a higher drop-out rate, higher current public expenditures due to high salaries paid teachers from France, and very expensive and luxurious school buildings.

The cost of industrial training in secondary schools in Tunisia is also higher than in Jordan. Using the day industrial student cost data given in Table 6-6, the present value of industrial section schooling for three years in Tunisia is 1956 TDs, while that of Jordan is 925

Chart 6-1

Comparative Costs of Industrial and General Section Graduates of Three Years Schooling and One Year in the Intervening Center, in TDs

Part (A)
(Per-pupil cost basis)


INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-pupil cost in three years in the industrial section
593 TDs
Present value of per-pupil cost in three years in the general section
294 TDs
2.0:1
Present value of per-trainee cost: Intervening training for both graduates
785 TDs
Present value of per-pupil cost: Industrial section and intervening training
1378 TDs
Present value of per-pupil cost: General section and intervening training
1080 TDs
1.3:1

* * * * * * * * * * * * * *

Part (B)
(Per-successful graduate cost basis)

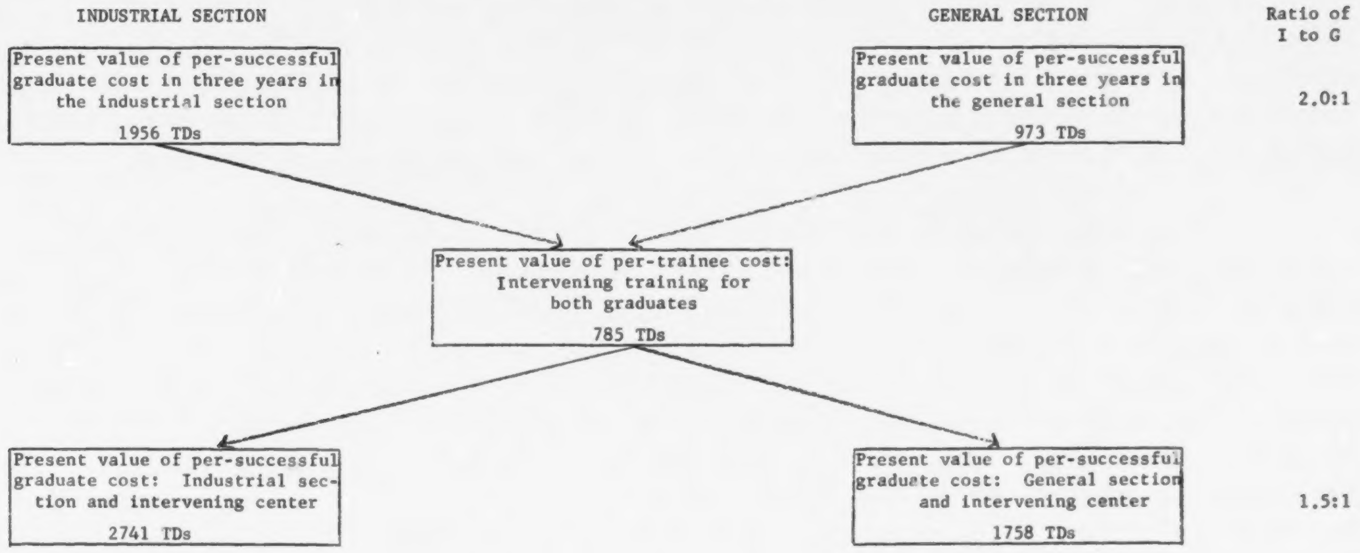
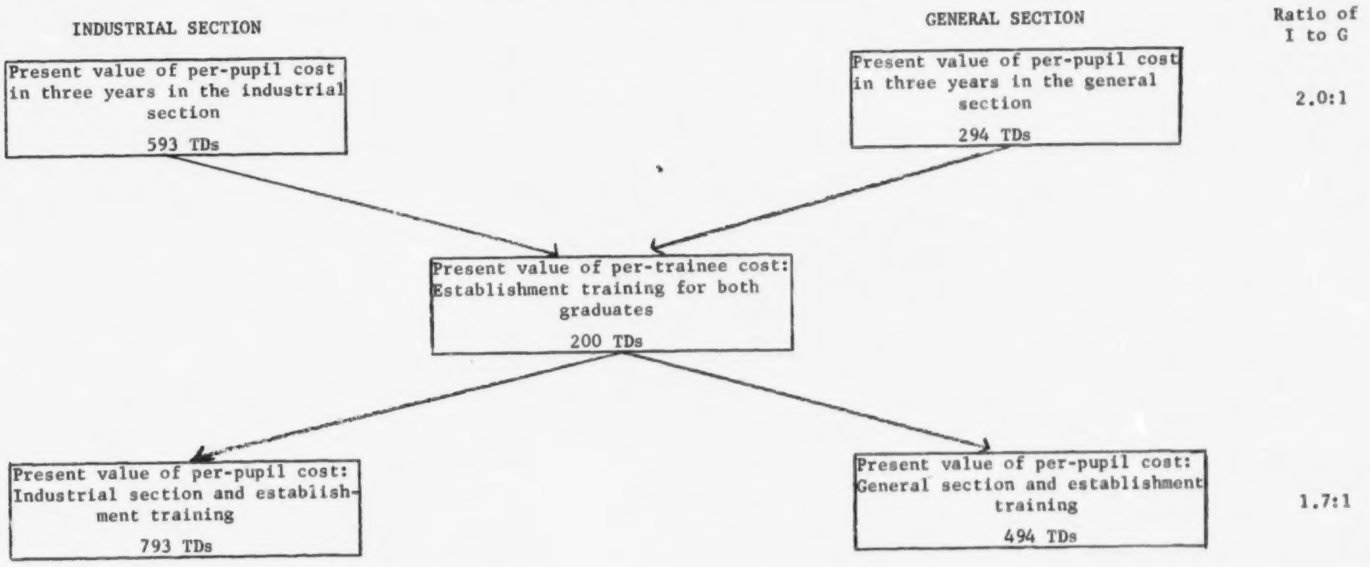

INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-successful graduate cost in three years in the industrial section
1956 TDs
Present value of per-successful graduate cost in three years in the general section
973 TDs
2.0:1
Present value of per-trainee cost: Intervening training for both graduates
785 TDs
Present value of per-successful graduate cost: Industrial section and intervening center
2741 TDs
Present value of per-successful graduate cost: General section and intervening center
1758 TDs
1.5:1

Chart 6-2

Comparative Costs of Industrial and General Sections Graduates of Three Years Schooling and One Year in the Employing Establishment Center, in TDs

Part (A)

(Per-pupil cost basis)


INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-pupil cost in three years in the industrial section 593 TDs
Present value of per-pupil cost in three years in the general section 294 TDs
2.0:1
Present value of per-trainee cost: Establishment training for both graduates 200 TDs
Present value of per-pupil cost: Industrial section and establishment training 793 TDs
Present value of per-pupil cost: General section and establishment training 494 TDs
1.7:1

* * * * * * * * * * * * * *

Part (B)

(Per-successful graduate cost basis)

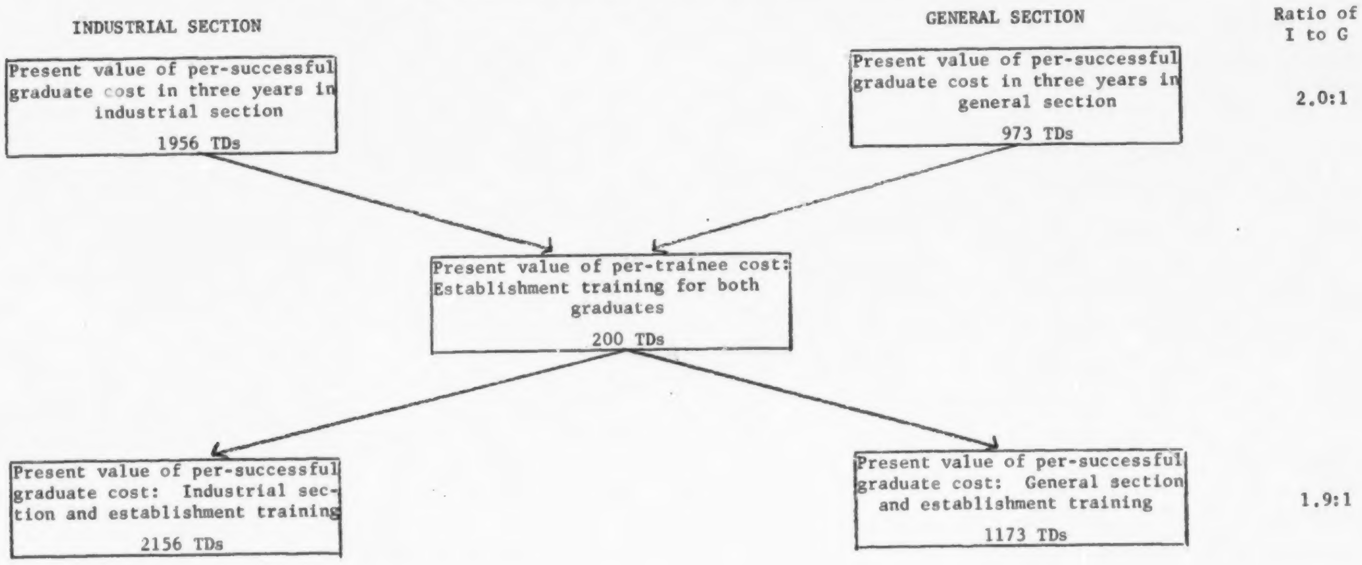
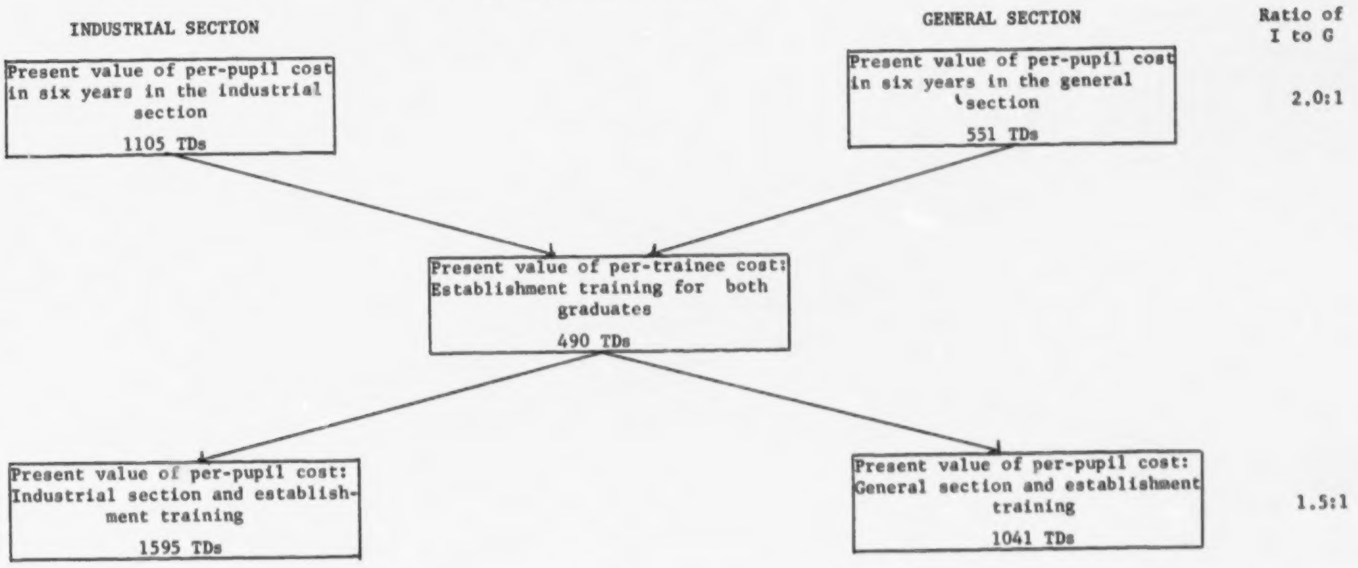

INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-successful graduate cost in three years in industrial section 1956 TDs
Present value of per-successful graduate cost in three years in general section 973 TDs
2.0:1
Present value of per-trainee cost: Establishment training for both graduates 200 TDs
Present value of per-successful graduate cost: Industrial section and establishment training 2156 TDs
Present value of per-successful graduate cost: General section and establishment training 1173 TDs
1.9:1

Chart 6-3

Comparative Costs of Industrial and General Sections Graduates of Six Years Schooling and One Year in the Employing Establishment Center, in TDs

Part (A)

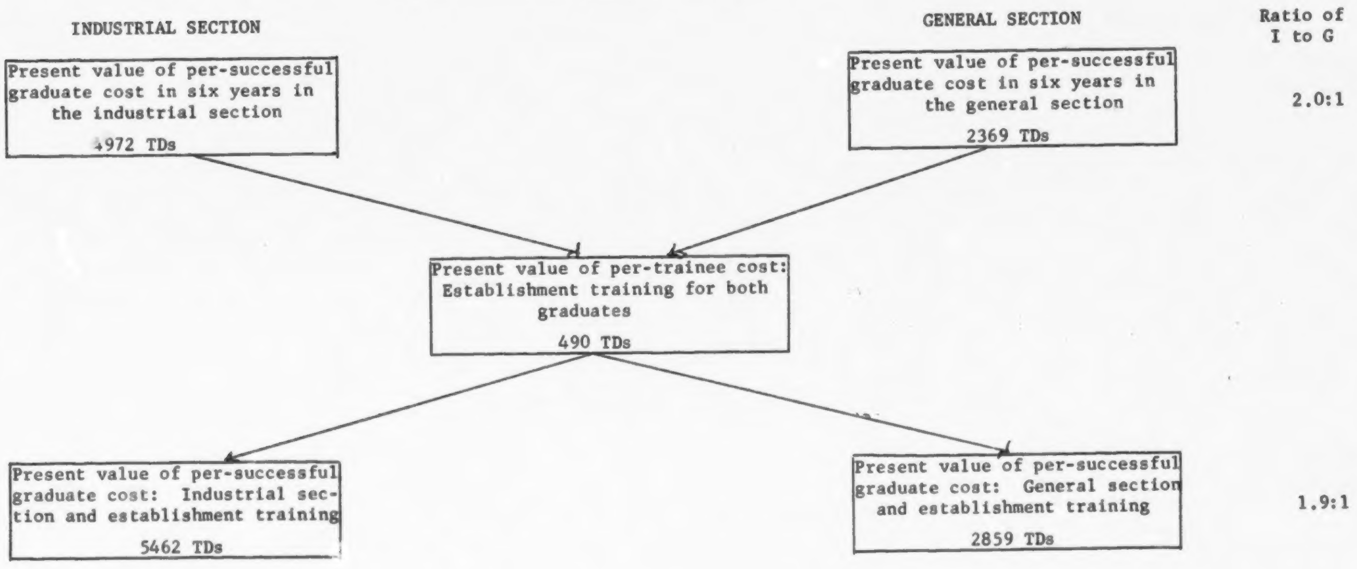
(Per-pupil cost basis)


INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-pupil cost in six years in the industrial section 1105 TDs
Present value of per-pupil cost in six years in the general section 551 TDs
2.0:1
Present value of per-trainee cost: Establishment training for both graduates 490 TDs
Present value of per-pupil cost: Industrial section and establishment training 1595 TDs
Present value of per-pupil cost: General section and establishment training 1041 TDs
1.5:1

* * * * * * * * * * * * * * * *

Part (B)

(Per-successful graduate cost basis)


INDUSTRIAL SECTION
GENERAL SECTION
Ratio of I to G
Present value of per-successful graduate cost in six years in the industrial section 4972 TDs
Present value of per-successful graduate cost in six years in the general section 2369 TDs
2.0:1
Present value of per-trainee cost: Establishment training for both graduates 490 TDs
Present value of per-successful graduate cost: Industrial section and establishment training 5462 TDs
Present value of per-successful graduate cost: General section and establishment training 2859 TDs
1.9:1

TDs [Al-Bukhari:160]. The ratio is 2.1:1. The magnitude of the problem of expensive specific training in Tunisian schools becomes apparent when we remember that this type of training is provided in almost all college moyen and secondary schools. On the other hand, in Jordan this type of education is provided for a relatively small number of students in only four schools.

BENEFITS

Since the cost of educating and training a student to become a skilled worker consists of public and private costs, both public and private benefits should be considered in the evaluation of education and training. The availability of reasonably adequate cost data made it possible for the researcher to estimate the private and public costs of education and training in Tunisia. Benefits are less easily calculated. Probable income may be estimated, but some benefits, both private and social, are intangible and thus not measurable.

Some skilled Tunisians work abroad. Workers are attracted abroad either because they get higher earnings than at home or because employment may not be available at home. The higher earnings can be considered a private benefit over and above what the worker would earn in Tunisia. Part of the additional income is usually sent back to Tunisia to be shared with families. It may also be considered a public benefit in the form of additional taxes.

The training centers of the Office of Training and Employment may be considered a social benefit because they train some of the educational system drop-outs for better employment opportunities than they would otherwise have. The college moyen schools, since they accept the qualified students who were not admitted to the secondary schools, can be credited with some social benefits. Yet this social benefit is counterbalanced by the fact that the industrial sections of the college moyen, as well as those of the secondary schools, have a high rate of drop-outs. A high rate of drop-outs is particularly disturbing considering how expensive industrial education and training is in Tunisia. This researcher feels that the industrial sections of the educational system do relatively little to alleviate the problem of drop-outs.

BENEFIT/COST ANALYSIS

Benefit/cost ratio analyses have been used in several case studies [Leff:110,Corazzini:1966, Al-Bukhari:1968]. The technique of discounting costs and returns is employed. The streams of returns and the streams of costs for each of the investments are discounted to their present value. If the discounted net returns of two alternatives outweigh the discounted costs, then -- so far as the measured characteristics taken into account in the benefit/cost analysis are concerned -- the alternative whose returns outweigh costs by the largest amount should be chosen for action. In addition to these measured factors, the intangible benefits and costs that might accrue to the individual or society should also be taken into consideration.

In this analysis, the graduates of both the general and industrial sections of the second cycle of education will be compared. It is assumed that three years of secondary industrial or secondary general education in the college moyen or six years in the secondary school program, plus any additional training provided in the intervening system or in the employment system, bring a certain stream of returns. This takes the form of income over and above what is earned by the person whose education is terminated at the end of the sixth grade. If the streams of net returns are discounted back and compared with the discounted costs, a given ratio of benefits to costs is obtained.

Data concerning lifetime earnings of industrial or general section graduates are not available. Only initial salaries could be determined. According to the findings of the present research, both kinds of graduates usually get the same initial earnings when they are employed in the same establishment and when both got post-school training in either the intervening system or the employment system. The findings indicated that the average initial earning of a worker with three years of college moyen education, whether industrial or general, plus a year of training after school, is 25 TDs per month or 300 TDs per annum. On the other hand, the average initial earning of a worker with six years of secondary education, whether industrial or general, plus a year of post-school training, is 35 TDs per month or 420 TDs per annum.

Given this situation, in which cost data are available but not data by which to estimate lifetime earnings, the method of Davie [10] will be followed to determine the future additional income which would have to be earned by the graduate, over and above what the sixth grader earns, in order to cover the costs of education and training in school and in the intervening system or the employment system. Costs will be covered by additional benefits within an assumed period of time using an "arbitrarily selected benefit/cost ratio." The approach is summarized by Davie: "What does the amount of benefits in terms of additional future income of students trained in the program have to be, given the costs of the program (underlining mine) so that the ratio of benefits to costs would at least equal the pre-determined level? The derived amount of benefit can be expressed in terms of average annual additional earnings per student." [Davie:10]

Benefit/Cost Ratios of College Moyen and Intervening System Center Graduates

1. Industrial section and intervening center combined on a per pupil cost basis. For the benefits of the training program in the industrial section of the *college moyen* and the intervening center combined to be just equal to the costs (1378 TDs, chart 6-1A), the graduate would have to earn additional future income which has a present value of 1378 TDs. Taking the period of twenty years as the length of time over which students could be expected to cover the costs of their training, the amount 1378 TDs can be converted into the average annual additional future income by dividing by a factor equal to the present value of an annuity of one TD per year for twenty years at a 5% interest rate [Davie:11]. This factor is 12.46, and thus the average amount of additional future income for twenty years should be 111 TDs, on the assumption of a 1:1 benefit/cost ratio and a 5% interest rate. If the ratio is to be 2:1, the average annual amount of additional benefits should be 222 TDs. If the ratio is to be 3:1, the average annual amount of additional benefits should be 333 TDs. In other words, for the training to be justified in these benefit/cost ratio terms, the worker who is the product of the industrial section of the *college moyen* (a day student) and the intervening center should earn 333 TDs over and above what the sixth grader earns annually (assuming 20 years of work, a 5% interest rate, and a 3:1 benefit/cost ratio).

According to the findings of the present research, a worker with three years of post-elementary education, whether general or industrial, plus training either in the intervening center or in the employing establishments centers, earns an initial salary of 25 TDs monthly or 300 TDs per annum. Taking only the first-year salary into consideration, the worker earns an additional annual income over and above what the sixth grader earns by 180 TDs (annual earning of the sixth grader is estimated at 120 TDs per annum). Assuming that this actual additional income for the initial year persists for 20 years, the amount is sufficient to cover what the worker should earn only if the benefit/cost ratio is 1:1. It falls short of the 2:1 benefit/cost ratio by 80 TDs (222 - 180 = 42), and falls short of the 3:1 benefit/cost ratio by 210 TDs (333 - 180 = 153). In other words, taking initial salaries only into consideration, the costs of training cannot be covered if the benefit/cost ratio is 2:1 or more and the interest rate 5%.

If the calculations are based on a per successful graduate cost basis (2741 TDs, chart 6-1B), the average amount of additional future income for twenty years should be 219 TDs on a 1:1 benefit/cost ratio, 438 TDs on a 2:1 benefit/cost ratio, and 657 TDs on a 3:1 benefit/cost ratio. Actual additional annual earnings fall far short of these three amounts. Costs per successful graduate are not covered in twenty years on a 5% interest rate.

2. General section and intervening center combined on a per pupil cost basis (Chart 6-1A). According to the method of calculation used in the preceding section, the general section graduate who is trained in the intervening center has a benefit/cost ratio of 2.2:1. However, on a per successful graduate cost basis (Chart 6-1B), the general section graduate worker has a benefit/cost ratio of only 1.3:1.

Benefit/Cost Ratios of College Moyen and Employing Establishment Center Graduates

1. Industrial section and employing establishment center combined on a per pupil cost basis (Chart 6-2A). The necessary calculations show that the worker with industrial section and establishment center training has a benefit/cost ratio of 2.8:1. However, on a per successful graduate cost basis (Chart 6-2B), the benefit/cost ratio is just 1:1.

2. General section and employing establishment center combined on a per pupil cost basis. The worker has a 4:1 benefit/cost ratio. On a per successful graduate cost basis, the worker has a 2:1 benefit/cost ratio.

Benefit/Cost Ratios of Secondary School and Employing Establishment Center Graduates

1. Industrial section and employing establishment center combined on a per pupil cost basis (Chart 6-3A). Workers with six years of industrial education and one year of training in an establishment center were found to be earning an average of 35 TDs per month, or 420 TDs per annum (this is also the earnings of general section graduates with equivalent training in an employing establishment). The additional annual income is 300 TDs and the worker has a benefit/cost ratio of 2.4:1. On a per successful graduate cost basis (Chart 6-3B), the worker's earnings in twenty years cannot cover the costs of his training. In fact, the benefit/cost ratio is 0.7:1.

2. General section and employing establishment center combined on a per pupil cost basis (Chart 6-3A). The worker has a benefit/cost ratio of 3.5:1. On a per successful graduate basis (Chart 6-3B), the benefit/cost ratio is only 1.3:1.

FINDINGS ON A 10% DISCOUNT RATE

What would be the effect of using a different interest rate for discounting the future streams of income to present values? It might be argued quite convincingly that in a capital-poor country like Tunisia the "correct" interest rate for these calculations should not be 5%, but rather 8% or 10% or even 15% or more. In Table 6-19 the benefit/cost ratios are compared at 10% and 5% discount rates.

Table 6-19

Benefit/Cost Ratios at 10% and 5% Discount Rates and Twenty Years of Work

Category	Using per pupil cost		Using per successful graduate cost	
	10%	5%	10%	5%
1. *College moyen* plus intervening training				
a) Industrial section	1.1:1	1.6:1	0.56:1	0.8:1
b) General section	1.5:1	2.2:1	0.87:1	1.3:1
2. *College moyen* plus establishment training				
a) Industrial section	2:1	2.8:1	0.71:1	1.0:1
b) General section	3.0:1	4.0:1	1.30:1	2.0:1
3. Secondary school plus establishment training				
a) Industrial section	1.6:1	2.4:1	0.47:1	0.7:1
b) General Section	2.4:1	3.5:1	0.89:1	1.3:1

At a 10% discount rate, the existing arrangements of occupational education and training are even less favorable than at a discount rate of 5%. The most striking aspect of Table 6-19 is that on a per successful graduate cost basis, 10% discount rate, and twenty years of work, the benefits of a worker with industrial school background -- whether in the *college moyen* or secondary school -- do not cover costs. The benefits of workers with general education in secondary schools also do not cover costs. Only the worker who gets his general education in the *college moyen* and his training in an employing establishment training center just covers his costs.

PART THREE

Summary
and
Policy Implications

CHAPTER 7

SUMMARY AND POLICY IMPLICATIONS

The Aims of the Research

The present study had two major purposes. The first was to investigate and analyze the role played by the industrial sections of the educational system, the training centers of the intervening training system, and the training activities of the employment system in meeting middle-level manpower needs of employing establishments in Tunisia. The second purpose was to learn more about the output and cost of the three systems. The intention was to discover whether the three systems duplicated the teaching of specific skills and to analyze the extent to which the curriculum of the educational system was actually used in job performance or in the acquisition of new skills. The study also presented an analysis of the costs of education and training in each of the three systems and benefit/cost analyses of some of the existing alternatives in occupational education and training.

The Methodology

Occupational education and training in Tunisia is provided by the public educational system under the Ministry of Education, by what we have called the intervening training system under the Office of Training and Employment, and by the employment system, both through informal on-the-job learning and in training centers run by some employing establishments in the private and public sectors. Interviews with high officials in the three systems, with educators, and with training and recruitment officers were sought to obtain relevant facts, opinions, and attitudes concerning these various activities. Published and unpublished materials were collected, especially materials providing statistical data.

Information on the activities of the Ministry of Education and the Office of Training and Employment were available from the central administrative offices of each. It was more difficult to become acquainted with pertinent activities of employing establishments that train workers in specially designed training centers. The researcher is of the opinion that the training activities of the employing establishments are not well known, perhaps because they are not part of a Ministry or an Office. Because of this lack of publicity, the role being played by the employment system in occupational training is not sufficiently appreciated. Therefore, the researcher spent a considerable amount of time exploring the formal and informal training practices of the employing establishments. In fact, in-employment training in Tunisia is even more extensive than that described in this research. A full investigation of the training practices in the employment system is a necessary first step for any national reorganization of occupational education and training programs in Tunisia.

The activities of the three systems concerned with occupational education and training were analyzed in Part One. Part Two of the research focused on the workers in the employment system, with special attention to how they were educated and trained and to the utilization of their education and training in their current jobs. The following interview procedure was adopted. First, three industrial areas were selected. Second, in each of the three areas, a number of employing establishments were selected in the private and public sectors. Third, in each of the selected employing establishments, a sample of workers with different educational and training backgrounds was drawn. A total of 243 workers were interviewed with a set of structured questions. Interviews revealed the training history of the workers and, thus, the roles played by the three training systems and that played by the various curriculum components in present job performance and the acquisition of any new skills required to do the job. In addition to interviewing workers, the researcher visited their places of work to observe and to come into contact with the actual processes in which the workers are engaged. Also, employers, work supervisors, and training and recruitment officers were interviewed. The cooperation of the persons concerned in the employment system was greater than expected. It can be stated without hesitation that all of them viewed the research and the valuable time that was taken from their work hours for the interviews and the establishment visits as serving a useful purpose in the improvement of occupational training.

In order to measure the degree to which the school curriculum was utilized in job performance, a rating scale was devised. The curriculum was divided into four components, and each interviewed worker was rated according to the number of these components which he utilized. (See Chapter 5.)

To study the comparative costs of the various existing alternatives for the preparation of a skilled worker and to perform benefit/cost analyses for some of these alternatives, data were obtained from the Ministry of Education, the Office of Training and Employment, and the employing establishments that have training centers. Data on earnings were also obtained from the samples of interviewed workers.

Main Findings

The Ministry of Education operates an extensive program of specific training in the industrial sections of the college moyen and the secondary schools. Both types of schools contain specially designed workshops.

The skilled labor force includes workers who graduated from the industrial sections of the educational system, others who graduated from the general sections, and those who dropped out before completing their elementary or secondary schooling. There is a high rate of attrition in the second cycle of education as well as in the elementary schools. It was found that only 2% of the students who entered the first grade in 1955/56 finished the twelfth grade with diplomas in 1966/67. Drop-outs of the educational system who join the labor force do so either directly or after spending a year in one of the centers of the Office of Training and Employment.

The Office of Training and Employment operates three types of training centers: the preapprenticeship centers, the accelerated training centers, and the upgrading training centers. The clientele of these centers are the elementary school leavers, the drop-outs of the second cycle schools, and the graduates of the college moyen, respectively. The Office also supervises the apprenticeship activities of the employing establishments and places graduates of the college moyen in certain establishments as interns. The Office also conducts evening educational programs for already-employed workers. In short, the Office tries to act as a link between the graduates and drop-outs of the educational system and the employment system and its skilled labor needs. There is a trend toward transferring the training activities of the Office to the employing establishments where possible.

The employing establishments undertake various training activities. The most prevalent such activity engaged in by big and small, privately and publicly owned establishments, is the apprenticeship programs for elementary school leavers. The establishments receive technical and organizational help from the Office in these apprenticeship activities. As was mentioned above, the employment system also offers training facilities for the interns sponsored by the Office.

The most significant training activities of the employment system, however, are those represented by the training centers found in some employing establishments of the public sector, such as the Railways Company, the Cement Factory, the Tunis Electricity Power Station, and the Merchant Navy Training Center. The training programs offered in these centers are discussed in detail in Chapter 4. The researcher feels that these centers, and the other training activities undertaken by the employing establishments, offer a useful starting point for any future reorganization of occupational education and training in Tunisia.

The findings concerning the utilization of the school curriculum in doing current jobs revealed substantial duplication of learning. A school graduate sometimes learned a new trade, in addition to that learned in the school, either in a center of the Office of Training and Employment or in a center of the employment system or, in some cases, in both. Sometimes the repetition was a relearning of the school trade. The employing establishments retrained the majority of the recruited workers in job-related skills. It is important to note that many of the students of the industrial sections of the schools got training in new specific skills after graduation, and that they found the general theory component of their school curriculum most useful in acquiring the new skills. Specific skills learned in school were least utilized in employment. Of intermediate usefulness were the general skills and the specific theory. The fact that there are graduates of the general sections who are work-companions of those from the industrial sections suggests new avenues for exploration in the field of occupational training.

In the investigation of comparative costs, two of the alternatives in education and training were studied, a day industrial student and a day general student. It was found that the cost ratio, on a per successful graduate basis, was 2:1. The difference in costs between the two is due to the cost of the workshops in the case of the industrial student. If the comparison were made using the boarding industrial student and the day general, the ratio would be even less favorable to the industrial section.

It is noteworthy that costs are much higher in Tunisia than in Jordan. When the per successful graduate cost of the general education sections in Tunisia and Jordan are compared (in both cases for day students), the ratio is 5:1. The high cost of general education in Tunisia is due to the high rate of drop-outs, the high cost of teachers from abroad, and the prevalence of school buildings more expensive and luxurious than those in Jordan.

When the costs of training either in Office centers or in employing establishment centers were added to school costs, it was apparent that the products of the general sections remained less costly than the products of the industrial sections. It was also found that training in the establishment centers was less costly than training in the Office centers.

Since work-companions who are products of the general and industrial sections have about the same earnings, it was found that, on a per successful graduate cost basis, benefit/cost ratios for the general section graduates are more favorable than those for industrial section graduates. Yet, neither group in the case of the secondary school covers their costs by additional earnings in twenty years of work; that is, the break-even point is not reached. In the case of the three year _college moyen_ schooling, the industrial section graduate also does not cover his costs. The general section graduate of the _college moyen_ school was found to just cover his costs of training and education, if his training takes place in the employment system but not if it is in the centers of the Office.

Policy Implications

The findings in Tunisia suggest that it would be good policy for the educational system to put less emphasis on specific training and more emphasis on seeking to raise the level of educational attainment of students in order to produce readily trainable, rather than specifically trained, persons. The specific training required would then be provided in employment, either in centers run by the employing establishments, or in _job-related_ outside instruction provided by the Office of Training and Employment in _close cooperation_ with the employing establishments. Policy-makers in the field of occupational education and training should see first what the employment system can offer in training for specific skills for middle-level manpower, and then how other education and training agencies can plan their programs to provide a foundation for and to complement what the employing establishments can do.

Basic problems in the public educational system must be confronted as part of any reorganization of occupational education and training in Tunisia. To avoid making investment in education a losing venture, it is urgent, first, to study the problem of drop-outs and repeaters. Drop-outs and repeaters account in considerable part for the high cost of education. A second step is to relieve the educational system, so far as possible, of specific training functions. With this step educational costs will be reduced, as will waste through unutilized or duplicated training.

The researcher is of the opinion that when specific training ceases to be a function of the schools and the expensive workshops designed for specific training are not essential, the government will be able to build more schools, thus bringing schools nearer to the homes of the children. This step would automatically make the phenomenon of boarding sections for secondary school education unnecessary. By eliminating emphasis on the more expensive types of workshops and abolishing boarding sections, the Tunisian secondary educational system can raise its output of graduates from 2% of pupils who enter primary school to a much higher level, perhaps 20% or even 30%, without a proportionate increase in expenditures.

With the present low percentage of secondary school graduates, Tunisia is losing much of its potential human resources. Talks with educators gave the researcher the impression that the Ministry of Education is applying the philosophy of educating an elite at the secondary level. The cost of this is high in terms of material and human resources. Application of a more liberal and democratic philosophy of education would provide secondary education for more people, and, in the final analysis, society would benefit.

It may also be suggested that the second cycle of education be of one type only. The *college moyen* school is an unnecessary institution, the product of the belief that students are of two categories -- those who can benefit from secondary education and those who cannot. One secondary school for all who are eligible for the second cycle of education is a better formula. In this school, a curriculum should be offered in which science, mathematics, languages, and technology are emphasized. Preoccupational training can be offered in the schools in order to provide general skills and work habits which make students trainable when employed.

The researcher feels that the present expensive equipment of the workshops does not serve the purposes for which it was provided. To make the investment in such equipment more beneficial to society, it is suggested that the major part of the equipment be transferred to agencies outside the school system that are directly involved in *production* and *job-related training*. A workable solution might be to transfer the machines to the major employing establishments which operate training centers or could inaugurate training centers. It is suggested that this workshop equipment could provide the backbone for a formula for in-employment training which could be easily implemented in Tunisia. Major establishments could be production-oriented training centers in which trainees already committed to a specific type of employment engage in actual production processes under supervision while acquiring the new skills.

The Office of Training and Employment can be the agency for transferring the specific training functions from the schools to the employing establishments and for offering the necessary technical and organizational help to the training centers of employing establishments.

The Office of Training and Employment should also shift its emphasis from training persons who are not yet committed to employment to those who are. One practical principle is to train persons sponsored by employing establishments. With such a policy there is no danger that skills learned will not be utilized.

With the reform of the educational system, the Office of Training and Employment gradually would be relieved of the pressure of caring for drop-outs. The Office would perform functions of coordination between the schools and the employing establishments.

In conclusion, it can be said that, with the present costly arrangements in occupational education and training, Tunisia would need to devote more than the present 30% of the national budget to education in order to achieve the desired advances in educational opportunity for more of the people. Of course, the budgetary share of education cannot be increased further without adversely affecting other sectors of the economy and society as a whole. Therefore, to increase the effectiveness of educational expenditures, a change in the present arrangements is needed.

BIBLIOGRAPHY

Bourguiba, Habib
1967 Our Education Can Be Reformed. Tunis: Ministry of Education.

Al-Bukhari, Najati Mohammed Amin
1968 Issues in Occupational Education and Training: A Case Study in Jordan. Stanford, California: Stanford International Development Education Center (SIDEC), School of Education, Stanford University. (Processed.)

Centre de Selection Psychotechnique
1967 Esquisse de l'apport du preapprentissage a l'apprentissage. Tunis.

Code du Travail
1966 Code du Travail. Tunis: Imprimere Officielle.

Conant, James Bryant
1959 The American High School Today: A First Report to Interested Citizens. New York: McGraw-Hill.

Corazzini, A. J.
1966 Vocational Education, A Study of Benefit and Costs: A Case Study of Worcester, Mass. Princeton, N. J.: Industrial Relations Section, Princeton, University.

Davie, Bruce F.
1965 "Using Benefit-Cost Analysis in Planning and Evaluating Vocational Education." A paper prepared for David S. Bushnell, Director of Adult and Vocational Research, Bureau of Research, U. S. Office of Education. (Mimeographed.)

Debeavais, et al.
1961 Formation technique et developpment economique en Tunisie. Tunis: Mission UNESCO. April 1961.

Ennaceur, Mohammed
1967 "Tunisian Experience in Adaptation of Technical Education and Occupational Training to Employment Market Needs." In Occupational Education and Training for Development: An Account of the International Workshop Held July 24 through August 5, 1967, at Stanford, California, Marian C. Alexander-Frutschi, Editor. Stanford International Development Education Center (SIDEC), School of Education, Stanford University. (Processed.)

Fontaine, C.
1967 "L'Histoire de Majid ou image du jeune travailleur tunisien." In Revue De Psychologie Appliquee, Extrait du volume 17, No. 2-2^{e} Trimestre.

Foster, Philip J.
1965 "The Vocational School Fallacy in Development Planning." In Education and Economic Development, C. Arnold Anderson and Mary Jean Bowman, Editors. Chicago: Aldine Publishing Company, pp. 142-166.

Harbison, Frederick
1967 "Towards a More Integrated Analysis of Opportunities for Assistance to Developing Countries in the Development and Utilization of Human Resources." Washington: American Council of Education. (Mimeographed.)

Harbison, Frederick, and Charles A. Myers
1964 Education, Manpower, and Economic Growth. New York: McGraw-Hill.

Jong, S. N.
1966 Quelques aspects de la reforme de l'enseignement en Tunisie, Enseignement du Premier Degre. A doctoral dissertation, University of Amsterdam.

Jorgensen, Erling
1966 Utilization of the Graduates from Technical and Vocational Training Institutes in Tunisia. Tunis: Ford Foundation.

Keller, Franklin Jefferson
1955 The Comprehensive High School. New York: Harper and Brothers.

Khoi, Le Thah
1964 "Le ceut de l'education en Tunisie." Tunis: Ministry of Education. (Mimeographed.)

El-Kusi, Abdul Aziz
1966 A Survey of Educational Progress in the Arab States, 1960-1965. Beirut: UNESCO Regional Center.

Leff, Nathaniel H.
1968 The Brazilian Capital Goods Industry: A Case Study in Industrial Development. Cambridge: Harvard University Press.

Ministry of Education
1963 Our Educational Awakening, Educational Reform and Planning. Tunis.

Ministry of Education
1966 "Report on Technical Education in Tunisia." Tunis.

Ministry of Planning
1965 Four Year Plan, Manpower Planning. Tunis.

Ministry of Social Affairs
1966 Conseil National de la Formation Professionnelle et de l'Emploi. Service des Etudes et des Programmes. Tunis.

1967 Formation professionnelle et preparation preprofessionnelle feminine (Ou preapprentissage feminin). Tunis.

Al-Sabah
1967 Daily Newspaper. December 6 and 19, 1967.

Schultz, T. W.
1961 "Investment in Human Capital." American Economic Review: 51:1-17.

1966 The Economic Value of Education. New York: Columbia University Press.

Socialist Destouri Party
1967 Secondary Education Report. Tunis.

1967 Report on Elementary Education. Tunis.

Solomon, E. S.
1965 "Statistical Analysis and Quantification in Educational Planning." In Economic and Social Aspects of Educational Planning. Paris: UNESCO.

Staley, Eugene
1967 Planning Occupational Education and Training for Development. Preliminary draft. Stanford, California: Stanford International Development Education Center (SIDEC), School of Education, Stanford University. (Mimeographed.)

Tuqan, Ahmed
1962 "Report on Education in Tunisia." Typewritten preliminary report to the World Bank. Beirut.

United Nations
United Nations Activities in Tunisia, A Report.

Williams, Lady Gertrude
1963 Apprenticeship in Europe, the Lesson for Britain. London: Chapman and Hall.

APPENDIX

NAMES OF PERSONS CONTACTED OR INTERVIEWED

I. The Office of Training and Employment

Mr. Mohammed Ennaceur, Director General of the Office of Training and Employment.
Mr. Mohammed al-Ghadamsi, Technical Director of National Institute at Rades.
Mr. Mohammed al-Tarabulsi, Principal of Apprenticeship Centers, Tunis.
Mr. Sharif Hamza, Head of Research Section, Rades.
Mr. Abdul-Aziz Buzaidi, Taxation Officer, Rades.
Mr. Al-Taib al-Shamli, District Officer, Bizerte.
Mr. Umar al-Mullawih, Treasurer, Bizerte District.
Mr. Khair al-Din Ben Uthman, Assistant Administrator.
Mr. Ahmad al-Traiki, Principal of Accelerated Center, Rades.
Mr. Bashir Budali, Employment Officer, Placement Office, Tunis.
Mr. Haj Ali Abdul-Karim, Principal of Preapprenticeship Centers, Sousse.
Mr. Abdul-Hamid al-Suhgair, Employment Officer, Tunis.
Mr. Rashid Abdul-Kadir, Chief of Employment Section, Placement Office, Tunis.
Mr. Ali al-Nasifi, Supervisor of Apprenticeship, Tunis.
Mr. Al-Amjad Badr Uddin, Principal of Accelerated Center, Sousse.
Mr. Al-Habib al-Andalusi, Employment Officer, Sousse.
Mr. Al-Habib Balghith, Counselor, Sousse.
Mr. Ben Amar Amer, Ariana, Preapprenticeship Center.
Mr. Al-Hadi al-Tarabulsi, Treasurer, Ariana.
Mr. Yahya Bu Karsh, Employment Officer, Tunis.
Mr. Abdul-Aziz al-Bathi, Assistant Administrator, the Office of Training and Employment.
Mr. Ahmad Ben Amar, Treasurer of the Office of Training and Employment.
Mr. Bel-Hassan Haddad, Testing Center, Tunis.
Mr. Nasr Ben Hamidah, Chief of Preapprenticeship Centers, the Office of Training and Employment.
Mr. Galal Ben Arafah, Teacher, Hamam al-Anf, Preapprenticeship Center.
Mr. Saleh Haddar, Teacher, Ben Arous Preapprenticeship Center.
Mr. Rashad al-Assali, Assistant Administrator, the Office of Training and Employment.
Mr. Hussein Ben Hussein, Principal, Ariana Upgrading Center.
Mr. Al-Mungi Shaqrun, Principal, CIPE.

II. Employment System

Mr. Al-Barshawi, Mohammed, Civil Aviation Training Center.
Mr. Tuhami Azzamantar, Car Assembly Factory, Sousse.
Mr. Si Ben Said, Ministry of Communications Workshops.
Mr. Ibrahim Darweesh, Ministry of Communications Workshops.
Mr. Habib Azzaghal, Gas and Electricity Company, Gas Section.
Mr. Mohammed Salih Ben Ghars, Renault Car Repair.
Mr. Munsif al-Hulwani, Chief Clerk, Ministry of Public Works.
Mr. Khalid al-Ajami, Chief of Technical Section, Ministry of Public Works.
Mr. Mustafa Skik, Training Officer, Tools Factory, Sousse.
Mr. Mohammed Abu-Hanak, Technical Director, Tools Factory, Sousse.
Mr. Al-Hadi Beleid, Administrative Director, Tools Factory, Sousse.
Mr. Hafiz al-Mukhtar, Merchant Navy Training Center, Sousse.

III. Ministry of Education

Mr. Mohammed al-Mufti, Examinations Section.
Mr. Al-Shadhili al-Ayari, Tunis University.
Dr. Fadil al-Gamali, Tunis University.
Mr. Mohammed al-Traiki, Chief Clerk.
Mr. Al-Tigani Harshah, Productivity Center.
Mr. Mukhtar al-Bashrawi, Technical Inspector.
Mr. Mohammed Bu Salamih, Technical Inspector.
Mr. Mohammed Hirzallah, Lycee Technique Principal, Tunis.
Mr. Khalifih Dahmuni, College Moyen Principal, Ariana.
Mr. Uthman Mudyan, College Moyen, Ariana.
Mr. Al-Mungi Al-wargi, Secondary School, Bad al-Khadrah.
Mr. Faraj al-Gabas, Director of College Moyen Education.
Mr. Ataib Ellous, Planning Director.